Instruction Manual

MODEL 6350 CCIR-M (NTSC)
TELEVISION MODULATOR

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Scientific-Atlanta, Inc.

United States: Box 105027, Atlanta, Georgia 30348; Telephone 404-925-5000; TWX 810-766-4912; Telex 0542898
Canada: 1640 Bonhill Road, Unit 6, Mississauga, Ontario L5T 1C8, Canada; Telephone 416-677-6555; Telex 06983600
Europe: Horton Manor, Stanwell Road, Horton, Slough SL3 9PA, England; Telephone Colnbrook (02812) 3211; Telex 849406

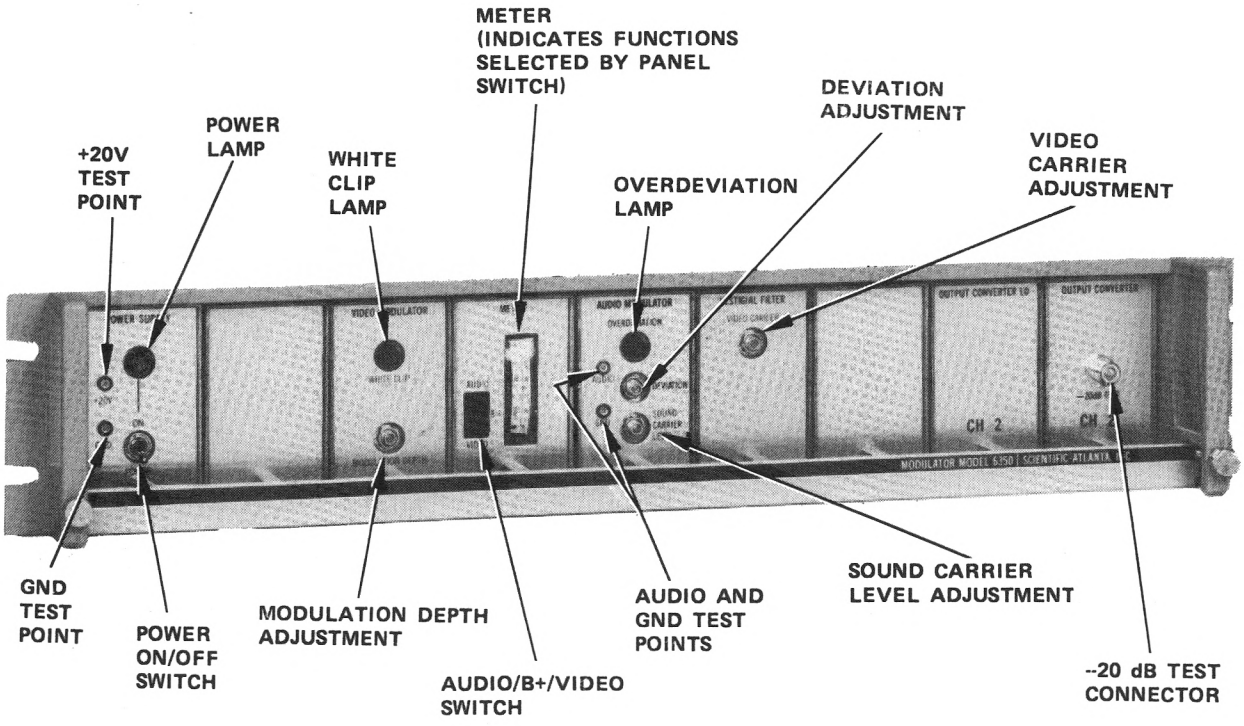
PRELIMINARY SET-UP INSTRUCTIONS FOR 6350 CATV MODULATOR

1. Supply input signals to Modulator.

   A. Video: 1-Volt peak-to-peak, baseband video to J6.

   B. Audio: -10 dBm to +10 dBm, baseband audio to terminals 10 and 11 on rear panel barrier strip.

2. In the Audio Modulator module, select proper position of input range switch (refer to the Audio Modulator module drawing).

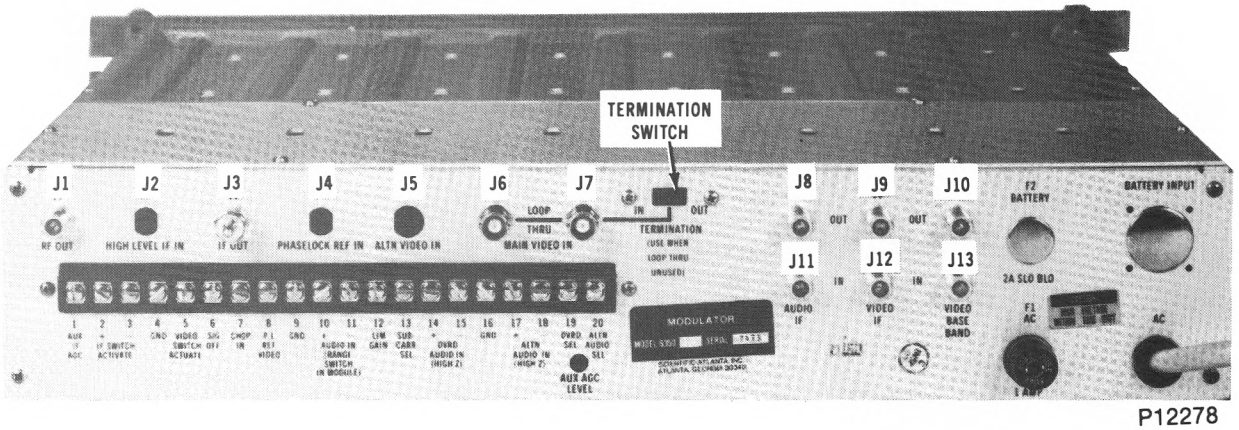


MODEL 6350 MODULATOR FRONT PANEL

3. On the rear panel, ensure that the termination switch is placed in the IN position.

Note

If the user is going to use the "loop-thru" feature, place the termination switch in the OUT position.



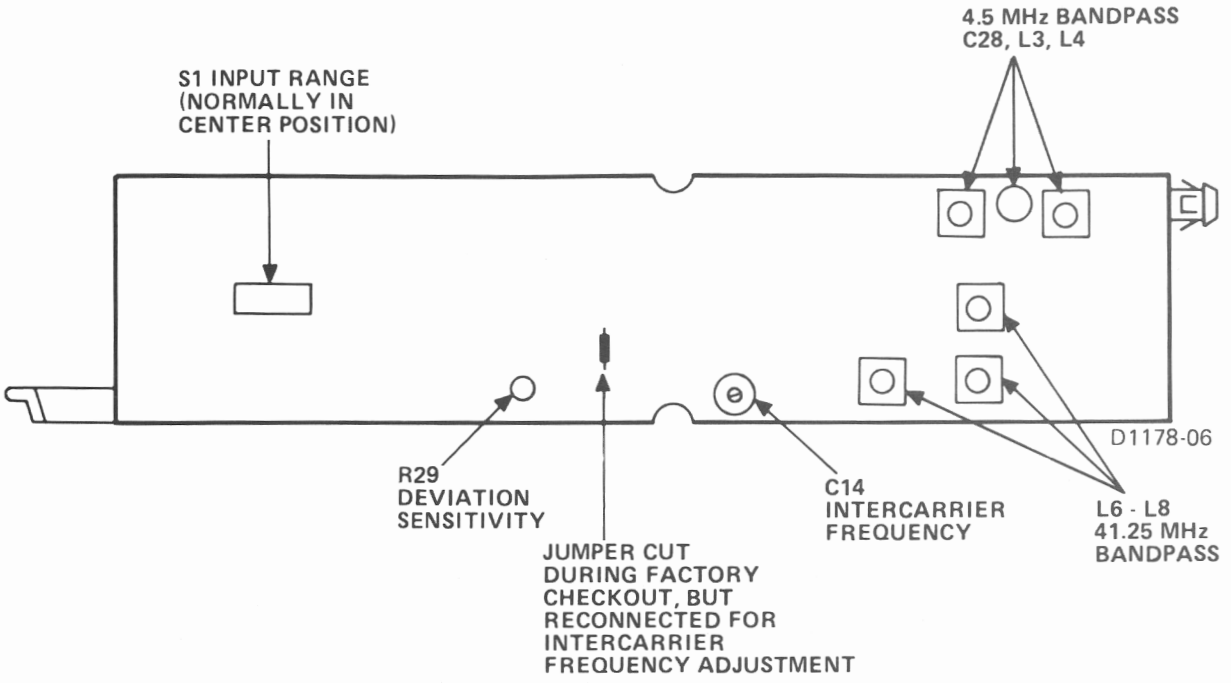
MODEL 6350 MODULATOR REAR PANEL

4. Adjust VIDEO CARRIER level control for +55 dBmV as seen on the RF output connector (J1).

5. Adjust SOUND CARRIER LEVEL control for +40 dBmV as seen on the RF output connector (J1).

6. If input signal is baseband video with 4.5-MHz subcarrier, connect the input to connector J6 and jumper terminal 13 to terminal 16 on rear panel barrier strip.

7. Adjust video modulation control for 87.5 percent modulation of carrier.



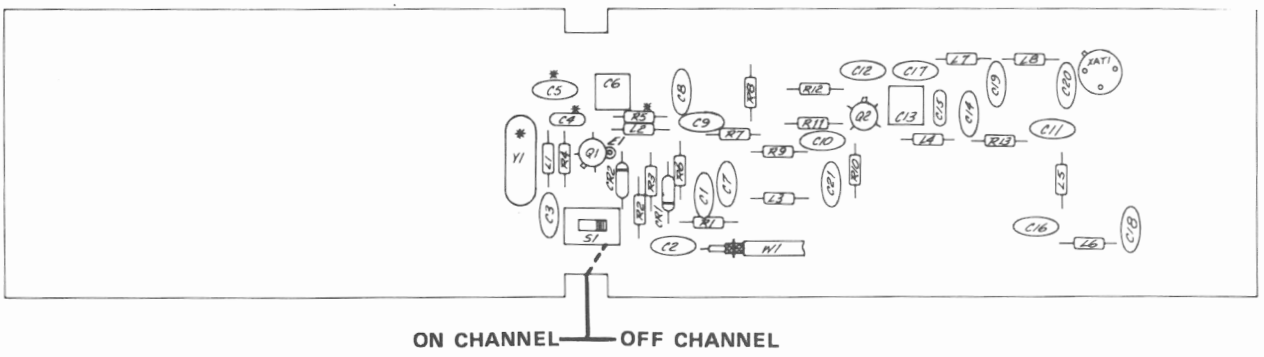
MODEL 6350 AUDIO MODULATOR MODULE

8. Adjust FM deviation control for 25 kHz.

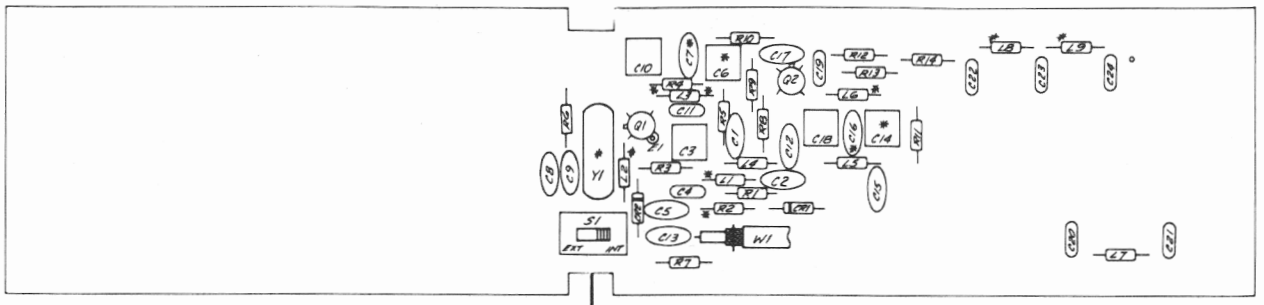
9. If the unit fails to operate:

   A. Ensure that all modules are properly seated.

   B. Ensure that the ON/OFF channel switch in the output converter local oscillator is in the proper position.



LOW BAND OUTPUT CONVERTER LOCAL OSCILLATOR



HIGH BAND OUTPUT CONVERTER LOCAL OSCILLATOR

10. If the unit still fails to operate properly, the user should read thoroughly the Model 6350 Television Modulator Instruction Manual (this preliminary set-up instructions is not intended to replace the instruction manual). Please phone (404) 925-5300 (within Georgia) or (800) 241-1966, extension 5300 (outside Georgia) for additional assistance.

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SECTION 1
GENERAL INFORMATION

1.1 GENERAL

The purpose of this instruction manual is to facilitate installation, operation, maintenance, and troubleshooting of the Scientific-Atlanta Model 6350 Modulator, including all standard options.

1.2 PURPOSE OF EQUIPMENT

The modulator is used to place a baseband television signal on a CATV system. It will accept audio input either at baseband or as a 4.5-MHz subcarrier. This modulator is designed to operate with television signals in the CCIR-M (NTSC) television format.

1.3 GENERAL DESCRIPTION

The Model 6350 Television Modulator (see figure 3-1) generates a high quality vestigial sideband TV signal on all cable television channels. Advanced circuit design results in the highest picture and sound fidelity from color or black and white video inputs and from either audio or 4.5-MHz subcarrier inputs. Application of a surface acoustic wave (SAW) filter results in exceptional vestigial sideband response characteristics. The SAW filter provides superior adjacent channel performance while retaining excellent group delay characteristics. Use of the SAW filter virtually eliminates vestigial sideband filter adjustments and provides excellent temperature stability.

To conform to accepted North American standards, a delay predistortion filter is provided integral to the video modulator. The filter is preceded by an isolation amplifier for improved input match. A loop-through input is provided on the main video input to permit additional video equipment to follow the modulator. When the loop-through feature is not used, a

built-in termination is switched to the input. A peak white-level clipper circuit limits video modulation to a maximum of 95%, eliminating the possibility of carrier cutoff or phase reversal, a major cause of sync buzz. A front-panel lamp indicates operation of the clipper.

Balanced 600-ohm audio input is provided, with field modification to high impedance bridging input possible. The audio input may also be used with an unbalanced source, as described in paragraph 2.3.2. Input level may be between -25 dBm and +25 dBm for full deviation. A 20-dB range is provided by front panel adjustment and an internal switch permits moving the "window" 15 dB in either direction. Audio pre-emphasis is accomplished in the feedback of an operational amplifier using precision components, to permit strict adherence to the standard 75-microsecond pre-emphasis curve. A front-panel OVERDEVIATION lamp flashes when the deviation exceeds 25 kHz. Besides accepting baseband audio input, the standard modulator accepts audio as a 4.5-MHz subcarrier combined with the baseband video.

Metering is through demodulation of the video and audio IF signals, and thus provides a check of the operation of the modulation circuits. Internal AGC and aural carrier limiting permit the meter module to be moved from one modulator to another without compromise in accuracy. The module may be inserted or removed while the modulator is in operation, without creating a change in operating parameters. Metering is provided for video depth of modulation, audio deviation, and regulated supply voltage. Video modulation metering includes metering of the color subcarrier component. Audio metering is based on a pre-emphasized signal to yield true response at all frequencies. A peak reading circuit is used, permitting accurate metering of complex speech and music waveforms.

The modulator provides a fixed level, composite IF output. This output is isolated from the signal path to the output converter, so that it can be used without affecting the RF output. Sufficient level is provided to obtain +60 dBmV output from a second Scientific-Atlanta 6150 series output converter. Front and rear-panel test points are provided to assist in module troubleshooting. Also provided are rear-panel

connectors for alternate IF and baseband inputs to facilitate program switching.

The phase lock option allows the 6350 Modulator to achieve phase lock to an off-air reference signal or to a comb generator. Operating specifications of the modulator remain unchanged except for the addition of the phase lock capability. A wide acquisition range of ±25 kHz assures acquisition under extreme conditions of reference carrier drift and offset. A video output, demodulated from the phase lock reference signal, is provided. This demodulated signal is used to permit an operator to gen-lock a local sync generator to the interfering reference signal, eliminating the effect of moving sync bars.

Scientific-Atlanta's Model 6150 processor and Model 6350 modulator share common power supply, output converter, local oscillator, and phase lock modules, reducing the difficulty of stocking spare modules for a complete headend.

As with all current Scientific-Atlanta headend equipment, the modulator packaging is in plug-in modules (with the exception of a few options). Modules may be operated on an extender (Model 6150-EXT). An extractor, Model 6150-ME, is available to aid in module removal. Side covers may be removed from the module, permitting access to both sides of the printed-wiring board while the unit is operating. Significant RF interconnections are made on coaxial cables with F terminations. These permit easy modification of the signal path for special applications and troubleshooting.

Powering is normally from 115V ac 50 - 60 Hz, with standby powering from +24 to +28V dc as an option. Alternatively, powering may be from a negative 19 to 32-volt battery supply.

1.4 OPTIONS

The Model 6350 Modulator is available with a number of options. These may be ordered from the factory or added in the field. Common options, available as standard products, are described below. Because of the versatile design of the modulator, many other configurations are possible. Our CATV applications engineering department should be consulted when unusual functional requirements arise.

1.4.1 VIDEO SWITCH

This option provides a circuit which monitors the incoming video signal. If video is lost or replaced by broadband noise (as from a demodulator with no input) a lamp on the front panel will illuminate. An internal solid state switch connects an alternate video source to the modulator. Switch activation may also be achieved remotely by contact closure. When switching between video sources, audio will automatically follow video if 4.5-MHz subcarrier audio is used. If baseband audio is used, the audio switch option described in paragraph 1.4.3 is used. If one source uses baseband audio and the other uses subcarrier audio, the audio switch is unnecessary, and the audio mode is controlled by the video switch.

1.4.2 VIDEO AGC

Video AGC normalizes video level between different video sources such as two video tape recorders, or removes level changes from incoming video. Sync amplitude is monitored, so the picture level will not affect AGC operation. Video AGC and Video Switch share a common module. If either option exists and the other is to be added, purchase of a Video Switch/AGC module will be necessary.

1.4.3 AUDIO SWITCH

An Audio Switch option provides for selection of an alternate audio source, and also permits switching to emergency override audio. Use of the alternate audio is normally in conjunction with the video switch option,

though the audio switch may be actuated without use of the video switch. When emergency audio override is selected, the audio response is shaped to enhance video intelligibility and reduce telephone line noise. The two inputs, alternate audio and override audio, are both bridging, balanced inputs, and accept an input level of -10 dBm to +10 dBm. Individual level controls are provided for each input.

1.4.4 AUDIO MODULATION LIMITER

An Audio Modulation Limiter option prevents accidental overdeviation of the aural carrier. If the audio exceeds a preset level, the modulation limiter automatically reduces the gain to prevent overdeviation. Very little distortion is introduced. When the signal returns to a lower level, gain is restored. The resulting sound is more pleasing to the audience because excess loudness and distortion is avoided. Attack time is within one cycle of the excessive signal duration, and thump and pumping are not detectable. Modulation limiting is effective for the main audio, alternate audio, and override audio inputs. A terminal on the rear panel may be grounded to defeat the limiter. When ungrounded, a voltage on this terminal is proportional to the amount of signal attenuation.

1.4.5 IF SWITCH

IF switching may be accomplished in a manner identical to the high level IF switching (OV option) in the 6150 processor. The composite (picture plus sound) IF is interrupted at a point just before upconversion to the output channel, and may be replaced by an alternate source of composite IF. The switch is solid state and may be actuated by application of an external contact closure or voltage, or may be activated by the video switch option, switching to an alternate IF source when video input is removed.

The IF switch is also used optionally in the Model 6150 processor and 6250 demodulator, and is available for customer use in other applications.

1.4.6 IF AGC

AGC control on the IF input provides for a constant output level when the alternate IF is being used. RF output level remains constant as the alternate IF signal strength changes. This option is normally used in conjunction with the IF switching option. The AGC option also provides gain and some bandpass filtering to the IF signal.

The AGC is also used optionally in the Model 6150 processor, and is available for customer use in other applications.

1.4.7 PHASE LOCK

The phase lock modules are identical to those used in the Model 6150 PL processor. A ±25 kHz minimum acquisition range assures phase lock without regard to the offset of the reference source. Phase lock is available for all output frequencies. When locking to a modulated source such as an off-air reference, baseband video demodulated from the reference source is available. This reference video may be used to gen-lock origination equipment, eliminating the moving sync bar, or "windshield wiper" effect, seen in many phase lock applications.

1.4.8 STANDBY BATTERY POWERING

Standby powering may be provided from a +24V to +28V dc source as in the SP option to the Model 6150 processor and Model 6250 demodulator. The modulator operates from 115V ac until power fails, then switches to a backup battery supply.

1.4.9 POWERING FROM -24V dc SOURCE

Negative dc powering permits the modulator to be operated from -19 to -32V dc battery supply in lieu of operating from 115V ac. This option would find application in conjunction with microwave radio sites using a negative battery for powering. This option is also available for the Model 6250 demodulator. Operation from 115V ac and negative direct current cannot be accommodated in the same unit.

1.4.10 SPECTRUM INVERTER

The Spectrum Inverter option inverts the video and audio carriers, placing the video carrier 4.5-MHz above the audio at RF. The signal is contained within the normal channel allocation, with the video carrier located 1.25 MHz below the upper channel boundry.

If the Spectrum Inverter option is provided, the phase lock option cannot be provided in the same modulator (refer to paragraph 2.4.10).

1.4.11 DUAL IF LOOP (DIFL)

The DIFL provides an interface with the Model 6700-065 scrambler for the AUDIO IF out and AUDIO IF in; also, the VIDEO IF out and VIDEO IF in. Connectors J8, J9, J11, and J12 are provided on the rear panel of the modulator only when the DIFL option is ordered; refer to table 3-2 for an explanation of the function of these connectors.

1.4.12 DUAL IF LOOP/VIDEO LOOP (DIFL/VL)

The DIFL/VL provides an interface with the Model 6700-065 scrambler when the video switch module or video switch/AGC module is provided in the modulator. Connectors J8 through J13 are provided on the rear panel of the modulator only when the DIFL/VL option is ordered; refer to table 3-2 for an explanation of the function of these connectors.

1.5 TECHNICAL SPECIFICATIONS

Table 1-1 lists the technical characteristics of the Model 6350 Modulator.

TABLE 1-1. MODEL 6350
MODULATOR TECHNICAL CHARACTERISTICS

Characteristic	Specification
VIDEO	
Input Type	Composite video, sync negative
Input Level	0.5V p-p minimum for 87.5% depth of modulation
Input Impedance	75-ohm, unbalanced (return loss 30 dB min.) or high impedance loop-thru
Frequency Response	±0.5 dB from 10 Hz to 4.2 MHz
Differential Gain	±0.18 dB maximum at 87.5% modulation
Differential Phase	±0.5° maximum at 87.5% modulation
Hum and Noise	60 dB down with respect to 90% modulation
Tilt	1% maximum on 60 Hz, 50% square wave
AUDIO INPUT	
Input Level	Normally set for -10 to +10 dBm. Internally switchable to two other ranges: +5 to +25 dBm -25 to -5 dBm
Input Impedance	600-ohm balanced. May be field modified for high-impedance bridging input. May be used with unbalanced sources.
Common Mode Hum Rejection	40 dB
Frequency Response	±0.5 dB from 30 Hz to 15 kHz
Carrier Shift with Modulation	±100 Hz or less

TABLE 1-1. MODEL 6350
MODULATOR TECHNICAL CHARACTERISTICS - continued

Characteristic	Specification
AUDIO INPUT - continued	
Harmonic Distortion	0.5% maximum, 30 Hz to 15 kHz at 25 kHz deviation
FM Hum and Noise	60 dB down with respect to 25 kHz deviation
Intercarrier Frequency Tolerance	Within ±500 Hz of being 4.5 MHz above video carrier (-7° to +50°C)
4.5 MHz FM INPUT	
Input Level	10 mV to 200 mV rms
Input Impedance	75-ohm unbalanced (normally supplied as composite picture and aural subcarrier input)
RF	
Output Frequency	Any standard VHF channel: sub-low; mid-band; superband; hyperband. Transposed video-sound channels available. Incremental and harmonically related coherent outputs are also available, as are non-standard output frequencies.
Output Impedance	75-ohm unbalanced (VSWR 1.35:1)
Output Level	+40 dBmV to +60 dBmV continuously variable
Spurious Outputs	60 dB below video carrier with video carrier at +60 dBmV and sound carrier at +45 dBmV
Frequency Tolerance Stability	+8 kHz VHF mid-band; ±10 kHz superband ±12 kHz Hyperband
Group Delay Response	Meets FCC predistortion requirements for color transmission
Vestigial Sideband Response	-20 dB at channel edge; -40 dB at adjacent picture and sound carrier frequencies and all frequencies farther removed from channel

TABLE 1-1. MODEL 6350
MODULATOR TECHNICAL CHARACTERISTICS - continued

Characteristic	Specification
PHASE LOCK OPTION	
Reference Input Frequency	Available in same frequency selections as output video carrier
Reference Input Level	
Through superband only	-10 dBmV to +40 dBmV
Hyperband	+2 dBmV to +60 dBmV
Acquisition Range	
Through superband only	±25 kHz
Hyperband	±17 kHz
Demodulated Video Output (Applicable through superband only)	1V p-p nominal, negative sync. Can be used for gen-locking to interfering modulation (color burst included)
Input Voltage	100 to 130V ac, 50 to 60 Hz; +24V dc nominal standby battery with optional built-in automatic switchover -or- -24V dc nominal battery operation with optional dc converter module
Input Power	40 watts
Operating Temperature Range	-7°C to +50°C (+20°F to +120°F)
VIDEO SWITCH OPTION	
Differential Gain	Less than 0.1 dB, 10 to 90% APL
Differential Phase	Less than 0.3 degree, 10 to 90% APL
Isolation	Greater than 50 dB at 6 MHz
Switch Delay On	10 ±3 seconds (can be internally programmed for instant on operation)
Switch Delay Off	Less than 1 second
VIDEO AGC OPTION	
Differential Gain, Phase	Included in video switch specifications
Input Level Range	0.5 to 2V p-p
AGC Regulation	±0.3 dB over specified input level range, with 1V p-p output

TABLE 1-1. MODEL 6350
MODULATOR TECHNICAL CHARACTERISTICS - continued

Characteristic	Specification
AUDIO SWITCH OPTION	
Alternate Audio Frequency Response	±1 dB, 30 Hz to 30 kHz (following standard pre-emphasis curve)
Override Audio Frequency Response	-3 dB at 300 Hz and 2.1 kHz (to improve audio clarity and reduce line noise)
Distortion	0.5% THD at any frequency (either mode). -10 dBm to +10 dBm, input level
Mid-Band Input Impedance (Differential)	40 kohms (alternate audio) 20 kohms (override audio)
AUDIO MODULATION LIMITER OPTION	
Threshold	25 kHz peak deviation
Attack Time	Within one cycle of excess deviation
Recovery Time	Approximately one second for 6 dB change
Total Harmonic Distortion	None below threshold; 1.5% max above threshold
Useful Dynamic Range	6 to 26 dB, depending upon setting of DEVIATION control
Compression Ratio (Above Threshold)	Greater than 20:1
IF SWITCH (AT 45 MHz)	
Insertion Loss	Less than 0.5 dB
Isolation	Greater than 70 dB
IF AGC	
Maximum Gain	20 dB
Minimum Gain	0 dB
Regulation	Less than 0.25 dB output variation for 10 dB input variation

1.6 WARRANTY

Each standard catalog product manufactured by Scientific-Atlanta, Inc., is warranted to meet all published specifications and to be free from defects in material and workmanship. The company's liability under this warranty is limited to servicing or adjusting equipment and/or replacement of defective parts of any equipment returned to the factory, freight paid by buyer, within a period of one year from date of shipment from the factory, unless a shorter period is specified. Equipment showing damage by misuse, or abnormal conditions of operations, shall be excluded from this warranty.

Cable and other items manufactured by others and not made an integral part of equipment of Scientific-Atlanta's manufacture shall carry the original manufacturer's warranty.

Products manufactured by Scientific-Atlanta, Inc., to customer's specifications are warranted to be free of defects in material and workmanship and shall conform to all specifications made a part of the contract or purchase order. Inspection and acceptance shall be conclusive as to fulfilling this warranty, except as to latent defects, fraud, or such gross mistakes as to amount to fraud, providing, however, that all claims made or to be made for any reason must be made in writing within one year of shipment from Scientific-Atlanta's plant. The responsibility of Scientific-Atlanta, Inc., under this warranty shall be limited to repair or replacement of defective work or parts returned to Scientific-Atlanta, Inc., with transportation charges to Scientific-Atlanta, Inc., plant and return paid by buyer. Scientific-Atlanta, Inc., may at its option elect to correct any warranty defects by sending its supervisory or technical representative at Scientific-Atlanta, Inc., expense to customer's plant or location within the continental United States, to make on-site corrections.

Note

Since Scientific-Atlanta, Inc., has no control over conditions of use, no warranty is made or implied as to suitability for customer's intended use, beyond such performance specifications as are made a part of the purchase order.

Equipment shipped f.o.b. Scientific-Atlanta, Inc., plant shall become the property of buyer upon delivery to and receipt from carrier. Damage in shipment should be handled by the buyer directly with the carrier by immediately requesting carrier's inspection upon evidence of damage in shipment.

Note

Do not return any Scientific-Atlanta product to the factory until shipping instructions are received.

When Scientific-Atlanta products require repairs after expiration of warranty period that necessitate factory return, the following steps should be taken:

a. Notify Scientific-Atlanta giving full details of the difficulty, and include model and serial numbers. Servicing or shipping instructions will be returned promptly.

b. In cases of factory return, an estimate of the charges will be made before repairs are undertaken, if desired.

If additional technical information is needed, please call the Communications Group Product Support Department: Toll-free, 800-241-1966, extension 5300, outside Georgia; in Georgia, 404-925-5300.

SECTION 2
INSTALLATION

2.1 UNPACKING AND INSPECTION

While unpacking, carefully compare the bill of lading with the equipment, checking for in-transit damage at the same time. Should errors be noted, notify Scientific-Atlanta and the carrier as soon as possible, but only after double checking and sifting any packing materials.

2.2 INSTALLATION

2.2.1 MOUNTING

The instrument is designed for rack mounting, either directly into the rack or on rack-mount slides (optional). It should be mounted in a rack permitting some access to the rear of the unit. The modulator should be free of strong RF radiations emanating from nearby equipment, or from line transients capable of damaging the instrument. It is designed to operate at temperatures ranging from -7°C to +50°C (+20°F to +120°F). As with all electronic equipment, operation at high temperatures accelerates the deterioration of components. For this reason, consideration should be given to prevention of excessive heat buildup in the rack.

2.2.2 POWER REQUIREMENTS

The modulator should be operated from a 115V ac, 50 to 60 Hz source. The power source should be capable of delivering a minimum of 40 watts per modulator. If the dc (standby battery) option is supplied, the unit can also be powered from a dc source of +24V dc to +28V dc capable of supplying 1.2 amperes. If the negative dc powering option is supplied, the voltage should never exceed the limits of -19 and -32 volts.

Note total current consumption of all equipment on the same line before applying ac or dc power. Avoid sharing an ac source feeding heavy motors or other large current drains.

2.2.3 FUSE REQUIREMENTS

Fuse F1 on the rear panel is the ac power fuse, and should be a 1-ampere slow-blow type. If the dc (standby battery) option has been ordered with the unit, an additional fuse, F2, is located on the rear panel. This fuse should be a 2-ampere slow-blow type. In addition to the fuses mentioned above, there is a third fuse located inside the power supply module. This fuse is an overvoltage protection device and will blow if the regulated +20V B+ voltage exceeds +24V. This fuse should be a 2-ampere fast-acting type.

2.3 ELECTRICAL INTERFACE

This section describes electrical interfaces between the standard modulator and other equipment. Interface for options is covered in section 3.

2.3.1 VIDEO INPUT

The modulator accepts standard composite video with nominal amplitude of 1V p-p. Levels between 0.5 and 2V p-p can be accommodated. A loop-through configuration is provided on the main video input, to permit addition of video loads "downstream" from the modulator. When the loop-through configuration is used, one termination should be placed at the last piece of equipment in the chain. If the termination is to be at the modulator, then the termination provided should be switched IN.

2.3.2 AUDIO INPUT

Audio is supplied on the rear-panel barrier strip, terminals 10 and 11 with shield ground on 9. Terminals 10 and 11 represent a balanced input. A positive going signal on terminal 10 will cause the RF audio

carrier to go higher in frequency (for lower modulating frequencies). When using balanced audio wiring, connect the two input lines to terminals 10 and 11 with the shield to terminal 9. If the audio source is single ended (unbalanced), some experimentation may be required to obtain the best performance. As a start, try connecting the center conductor to terminal 10 and the shield to terminal 11, or vice-versa, with no connection to ground. If this results in hum, try grounding the shield to terminal 9, with and without connection to terminal 11. If this fails to clear up the hum, it may be necessary to move the source close to the modulator and experiment with power grounds, or use an audio isolation transformer.

As normally supplied from the factory, the modulator is set to accept input signals from -10 dBm to +10 dBm (0.7 to 7V p-p). If the signal level falls below this range, it will not be possible to deviate the sound carrier fully. If the signal level is excessive, then it will not be possible to turn the deviation control down far enough. Should either of these conditions exist, remove the audio modulator module and remove the top cover. The top cover is the one further away from the printed-connector fingers at the rear of the module. Near the front of the module is a rocker switch labeled "INPUT RANGE". Depressing the rear-facing side of the switch ("LOW") shifts the input range down so that the modulator now accepts input levels between -25 and -5 dBm. Depressing the front-facing side of the switch ("HI") shifts the input range to +5 to +25 dBm.

2.3.3 AUDIO SUBCARRIER INPUT

Frequently when signals are received from a CATV microwave link, and sometimes with baseband switching arrangements, audio is supplied not as a baseband signal, but as a 4.5-MHz subcarrier. Normally this subcarrier is combined with the baseband video signal. When using the modulator with such a signal, simply supply the combined video and audio subcarrier to the video input. Then ground terminal 13 (SUBCARR SEL) on the barrier strip. Ground is available on terminals 9 and 16. This places the audio module in a mode to accept the subcarrier, which is

supplied from the video module. No changes need be made to the video module unless, due to excessive subcarrier level, a color beat or FM-to-AM conversion pose a problem. In these cases, a 4.5-MHz trap in the video modulator may be switched in. The switch may be accessed by removing the top cover from the video modulator. Only the one switch is in this module. Move the switch toward the outside of the module to place the trap in the circuit. When using the subcarrier input, the audio meter will measure deviation of the subcarrier, but the OVERDEVIATION lamp will not flash on excess peaks; it will continue to indicate excess peaks of a baseband input if one is present.

2.3.4 IF OUTPUT

The IF output, J3, is a fixed level combined picture and sound signal. A nominal level of +42 dBmV is provided. This signal is independent of the signal path to the RF output. It is available for switching applications as required, but the connector should be terminated when not used.

2.3.5 RF OUTPUT

The RF output, J1, normally goes to the headend combiner. Output level may be adjusted between +40 dBmV and +60 dBmV using the VIDEO CARRIER control on the front of the modulator. Under nearly all circumstances, use of an external bandpass filter is NOT recommended. A filter is included in the output converter module, and adding an external filter will upset the overall match and response.

2.4 FIELD INSTALLATION OF OPTIONS

2.4.1 VIDEO AGC OPTION

Refer to figure 2-1 for installation details of the Video AGC option.

2.4.2 VIDEO SWITCH OPTION

Refer to figure 2-2 for installation details of the video switch option (also applies to video switch/AGC option).

2.4.3 AUDIO SWITCH OPTION

Refer to figure 2-3 for installation details of the audio switch option.

2.4.4 AUDIO MODULATION LIMITER OPTION

Refer to figure 2-4 for installation details of the audio modulation limiter option.

2.4.5 IF SWITCH OPTION

Refer to figure 2-5 for installation details of the IF switch option.

2.4.6 AUXILIARY IF AGC OPTION

Refer to figure 2-6 for installation details of the auxiliary IF AGC option.

2.4.7 PHASE LOCK OPTION

Refer to figure 2-7 for installation details of the phase lock option.

2.4.8 STANDBY +DC POWERING OPTION

Refer to figure 2-8 for installation details of the standby +dc powering option.

2.4.9 NEGATIVE BATTERY POWERING

Refer to figure 2-9 for installation details of the negative battery powering option. When this option is used, it takes the place of the POWER SUPPLY module.

2.4.10 SPECTRUM INVERTER OPTION

The spectrum inverter module is designed to be installed only in the position occupied by the phase lock servo module option (third module position from the right, when viewed from the front of the modulator).

Figure 2-10 illustrates the wiring on the rear connector plate assembly required for installation of the spectrum inverter option. A kit (part number 153258) is available from Scientific-Atlanta for field installation of the option. The parts for this kit are listed in table 2-1.

TABLE 2-1. SPECTRUM INVERTER OPTION
PARTS LIST 153258

Scientific-Atlanta Part Number	Description	Quantity
0230031	RF Cable Assy 6.25 inches	1
0230032	RF Cable Assy 7.25 inches	1
0082370	Conn., Coax F Female to Male Push-On Chassis Mount	2
0036139	Nut, RF Conn.	2

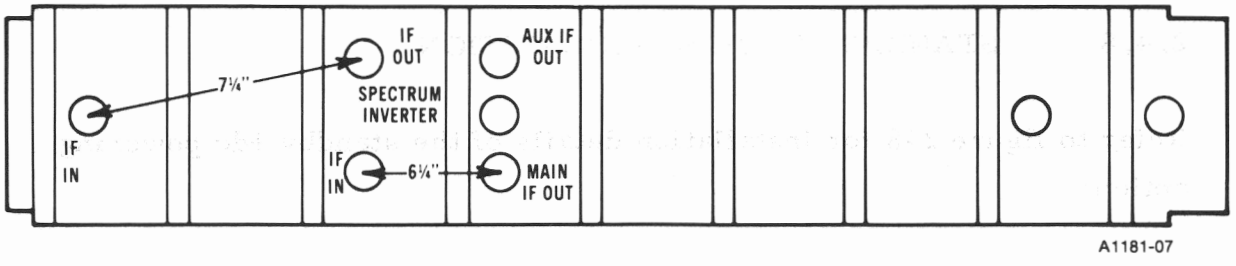


Figure 2-10. Rear Connector Plate Assembly for Spectrum Inverter Option

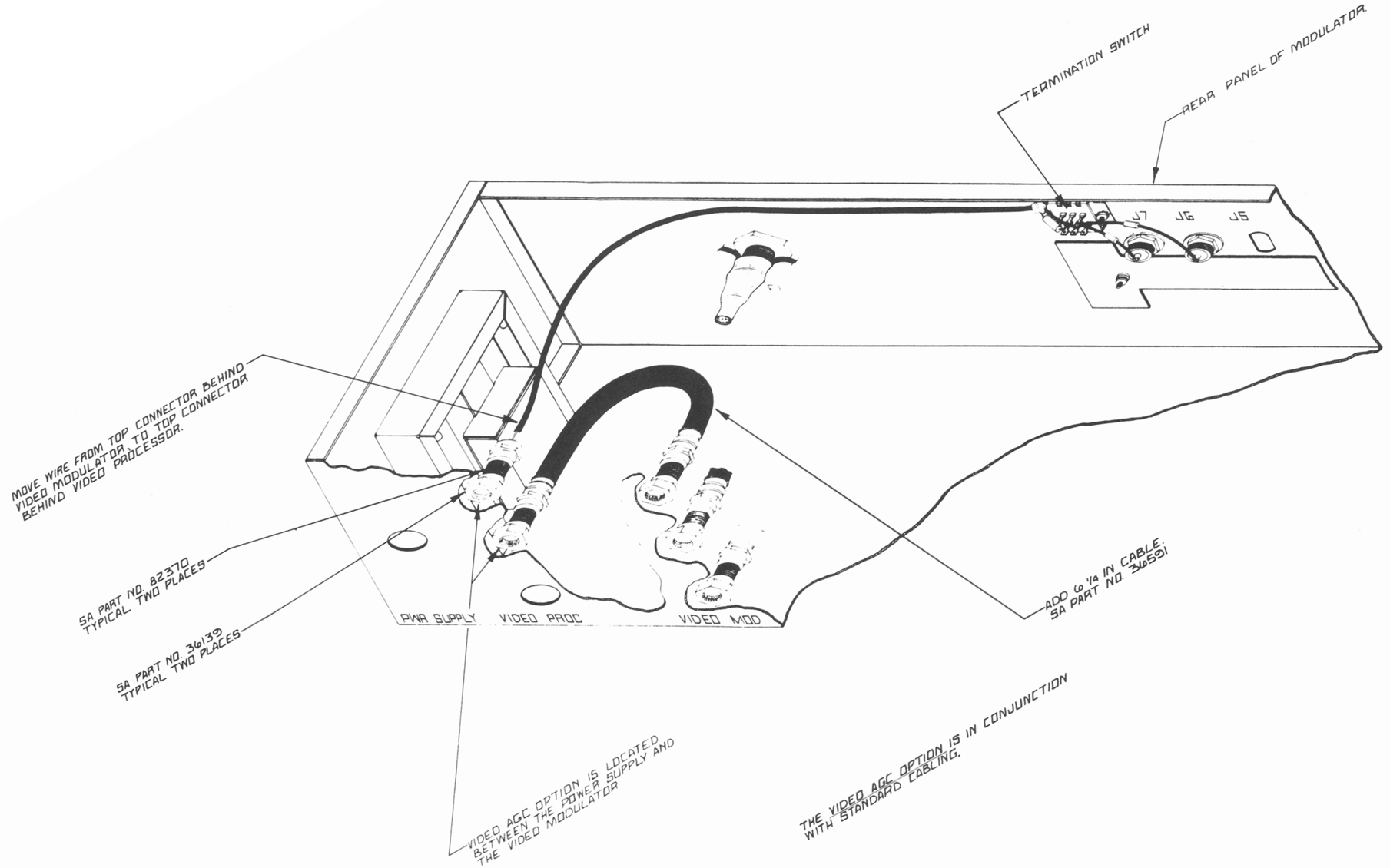
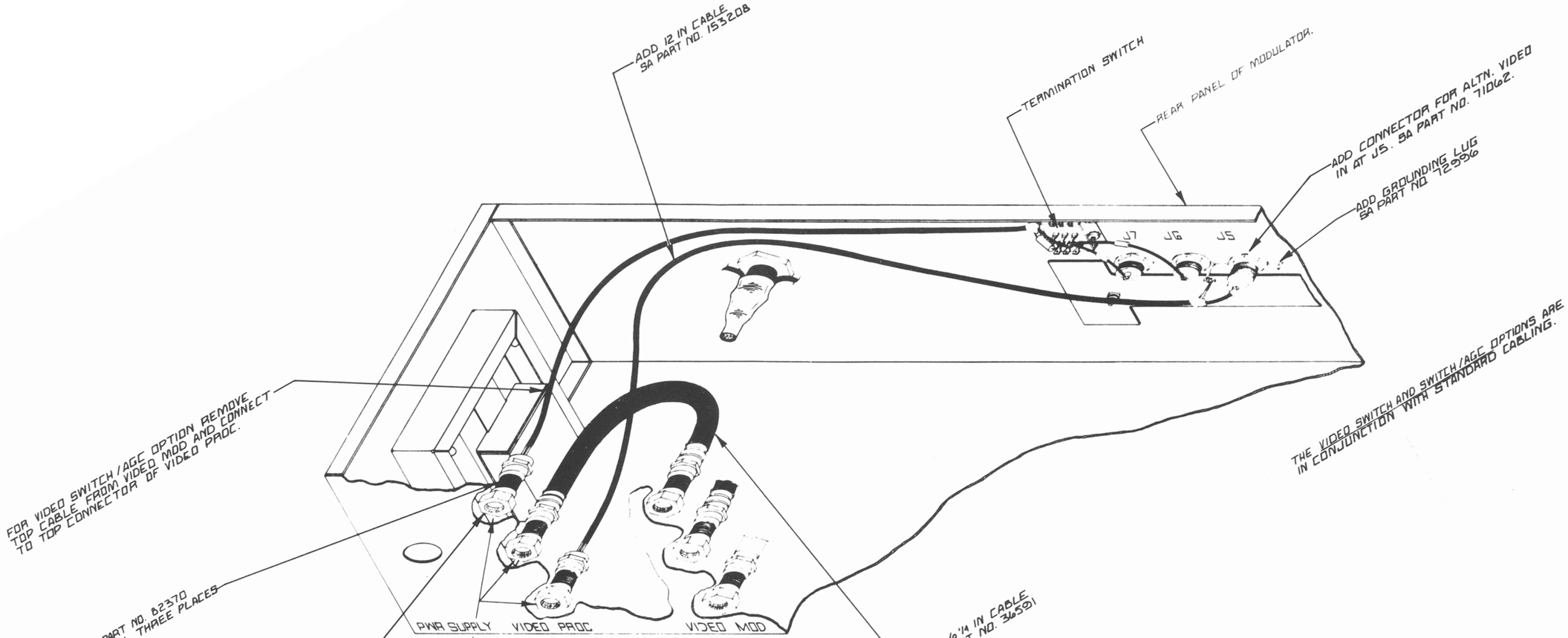
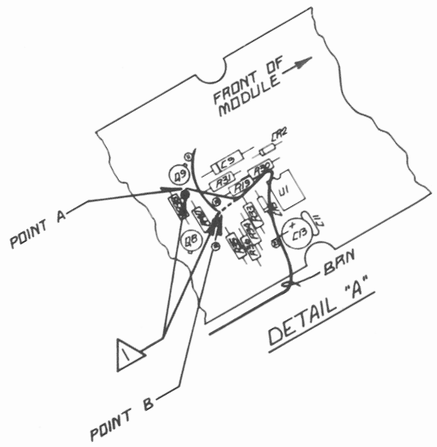

TERMINATION SWITCH
REAR PANEL OF MODULATOR.
J7
J6
J5
MOVE WIRE FROM TOP CONNECTOR BEHIND VIDEO MODULATOR TO TOP CONNECTOR BEHIND VIDEO PROCESSOR.
SA PART NO. 82370 TYPICAL TWO PLACES
SA PART NO. 36139 TYPICAL TWO PLACES
PWR SUPPLY
VIDEO PROC.
VIDEO MOD
ADD 6'/4 IN CABLE. SA PART NO. 34550
VIDEO AGC OPTION IS LOCATED BETWEEN THE POWER SUPPLY AND THE VIDEO MODULATOR
THE VIDEO AGC OPTION IS IN CONJUNCTION WITH STANDARD CABLING.

Figure 2-1. Model 6350
Video AGC Installation Diagram

162617

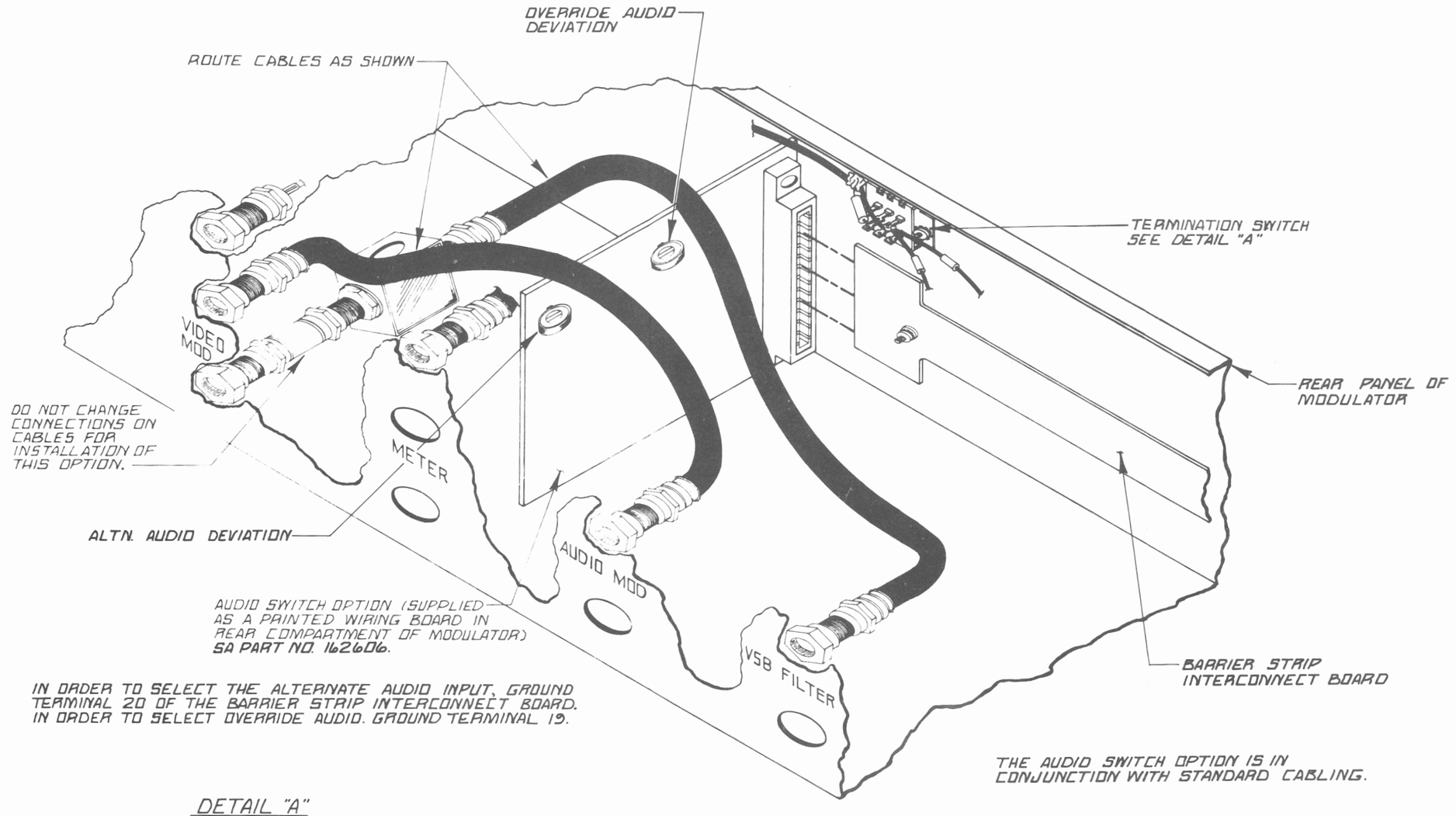

ADD 12 IN CABLE SA PART NO. 153208
TERMINATION SWITCH
REAR PANEL OF MODULATOR.
ADD CONNECTOR FOR ALTN. VIDEO IN AT J5. SA PART NO. 71062.
ADD GROUNDING LUG SA PART NO 72556
J7 J6 J5
FOR VIDEO SWITCH/AGC OPTION REMOVE TOP CABLE FROM VIDEO MOD AND CONNECT TO TOP CONNECTOR OF VIDEO PROC.
THE VIDEO SWITCH AND SWITCH/AGC OPTIONS ARE IN CONJUNCTION WITH STANDARD CABLING.
SA PART NO. 82370 TYPICAL THREE PLACES
SA PART NO. 36139 TYPICAL THREE PLACES
PWR SUPPLY
VIDEO PROC.
VIDEO MOD
ADD 6 1/4 IN CABLE SA PART NO. 36591
BOTH THE VIDEO SWITCH OPTION AND THE AGC OPTION CAN BE SUPPLIED SIMULTANEOUSLY - (LOCATED BETWEEN THE POWER SUPPLY AND THE VIDEO MODULATOR)



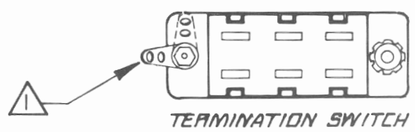
NOTE:

1. VIDEO SWITCH ONLY, DETAIL "A": BAR WIRE SHOULD BE AT POINT A EXCEPT WHEN THE VIDEO SIGNAL IS ACCOMPANIED BY SUBCARRIER AUDIO AND THE ALTERNATE VIDEO IS ACCOMPANIED BY BASEBAND AUDIO. IN THIS CASE, MOVE WIRE TO POINT B. THE BASEBAND AUDIO WOULD BE SUPPLIED BY MODULATOR. AGC/SWITCH OPTION IS USED, STRAP TERMINALS 10 AND 11 ON THE REAR. IF ONE SOURCE UTILIZES BASEBAND AUDIO AND THE OTHER UTILIZES SUBCARRIER AUDIO. STRAP TERMINALS 6 AND 11 ON THE REAR.

Figure 2-2. Model 6350
Video Switch
Installation Diagram


OVERRIDE AUDIO DEVIATION
ROUTE CABLES AS SHOWN
TERMINATION SWITCH SEE DETAIL "A"
REAR PANEL OF MODULATOR
VIDEO MOD
METER
DO NOT CHANGE CONNECTIONS ON CABLES FOR INSTALLATION OF THIS OPTION.
ALTN. AUDIO DEVIATION
AUDIO MOD
AUDIO SWITCH OPTION (SUPPLIED AS A PAINTED WIRING BOARD IN REAR COMPARTMENT OF MODULATOR) SA PART NO. 162606.
VSB FILTER
BARRIER STRIP INTERCONNECT BOARD
IN ORDER TO SELECT THE ALTERNATE AUDIO INPUT, GROUND TERMINAL 20 OF THE BARRIER STRIP INTERCONNECT BOARD. IN ORDER TO SELECT OVERRIDE AUDIO. GROUND TERMINAL 19.
THE AUDIO SWITCH OPTION IS IN CONJUNCTION WITH STANDARD CABLING.

DETAIL "A"



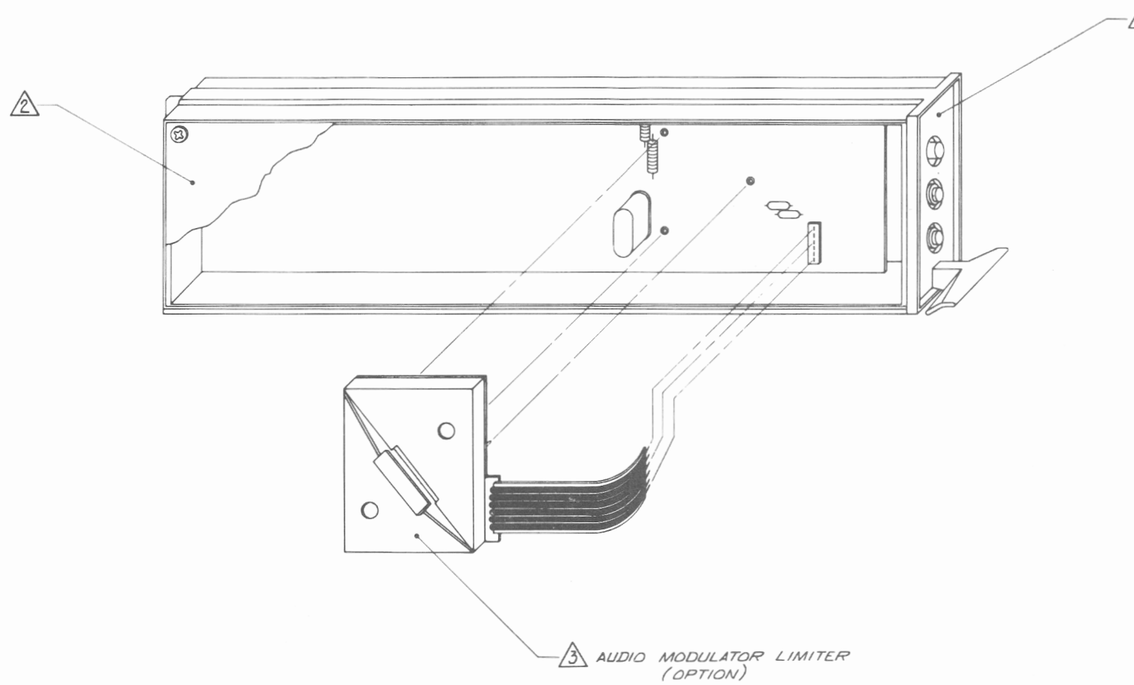
TERMINATION SWITCH

NOTE:

1. IT MAY BE NECESSARY TO LOOSEN AND MOVE GROUNDING LUG FROM HORIZONAL POSITION TO VERTICAL POSITION IN ORDER TO ALLOW CLEARANCE FOR THE AUDIO SWITCH BOARD.

162618

Figure 2-3. Model 6350
Audio Switch
Installation Diagram

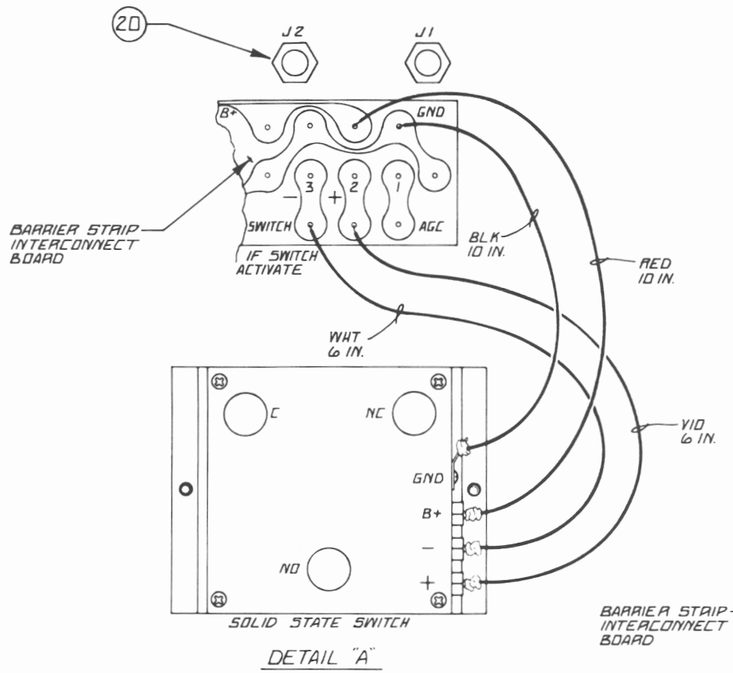


INSTALLATION PROCEDURE

1. REMOVE AUDIO MODULATOR FROM MAIN CHASSIS.
2. REMOVE LEFT SIDE COVER FROM MODULE.
3. PLUG IN AUDIO MODULATOR LIMITER PRINTED WIRING BOARD OPTION AND RIBBON CONNECTOR AS SHOWN.

162619

Figure 2-4. Model 6350 Audio Modulation Limiter Installation Diagram

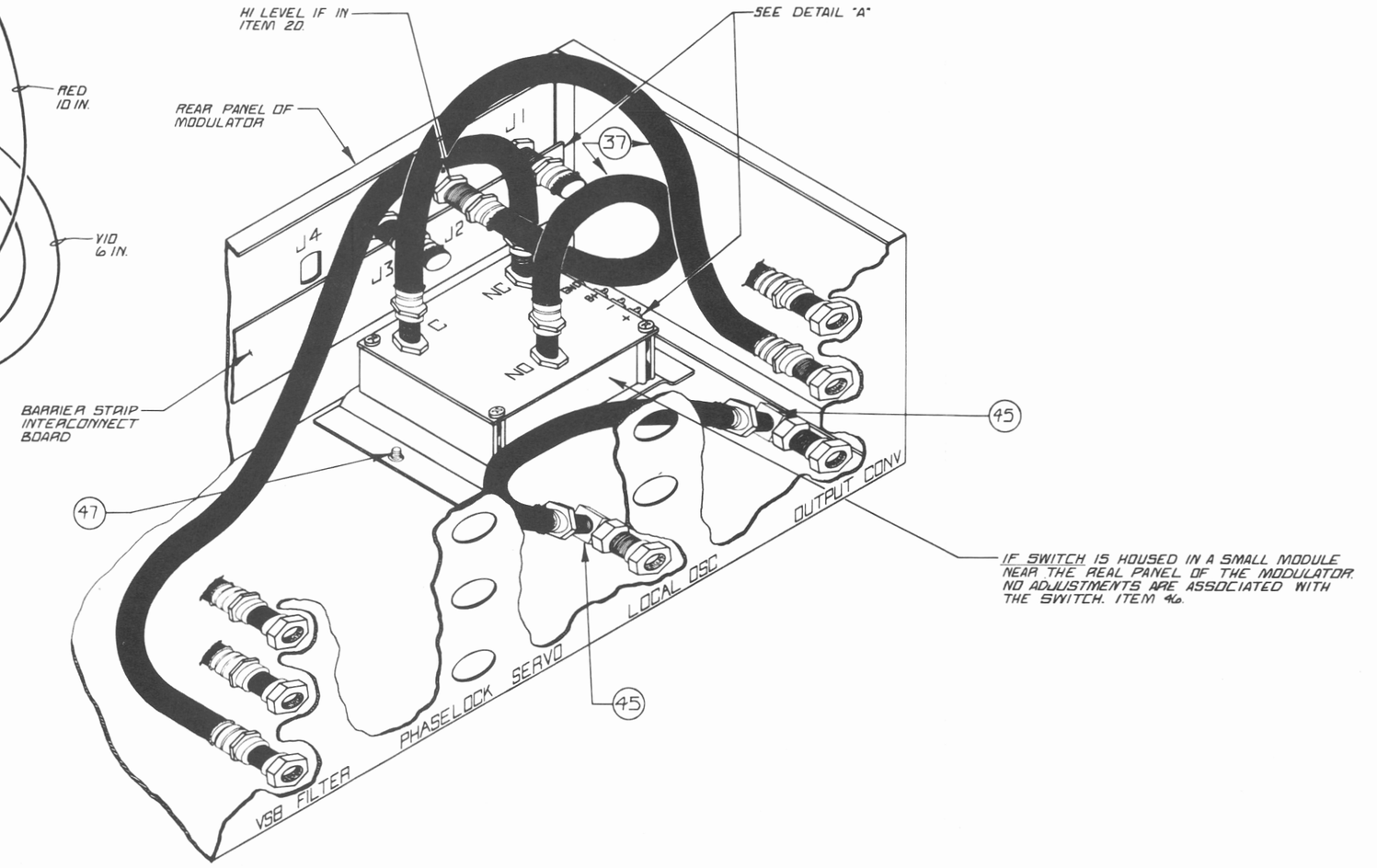


DETAIL "A"

IF SWITCH ACTIVATION:

1. GROUND TERMINAL 3 ON THE REAR PANEL BARRIER STRIP AS SHOWN, OR
2. APPLY A VOLTAGE IN EXCESS OF 5 VOLTS BUT LESS THAN 20 VOLTS TO TERMINAL 2 OF THE BARRIER STRIP.

PARTS LIST		
ITEM NO.	DESCRIPTION	SA P/N
20	CONNECTOR "F" BULLET	36200
37	CABLE, 7 IN.	36594
45	RIGHT ANGLE ADAPTER (ELBOW)	86826
46	SOLID STATE SWITCH (MODULE)	36595
47	SCREW, 4-40 x 1/4 IN.	72317

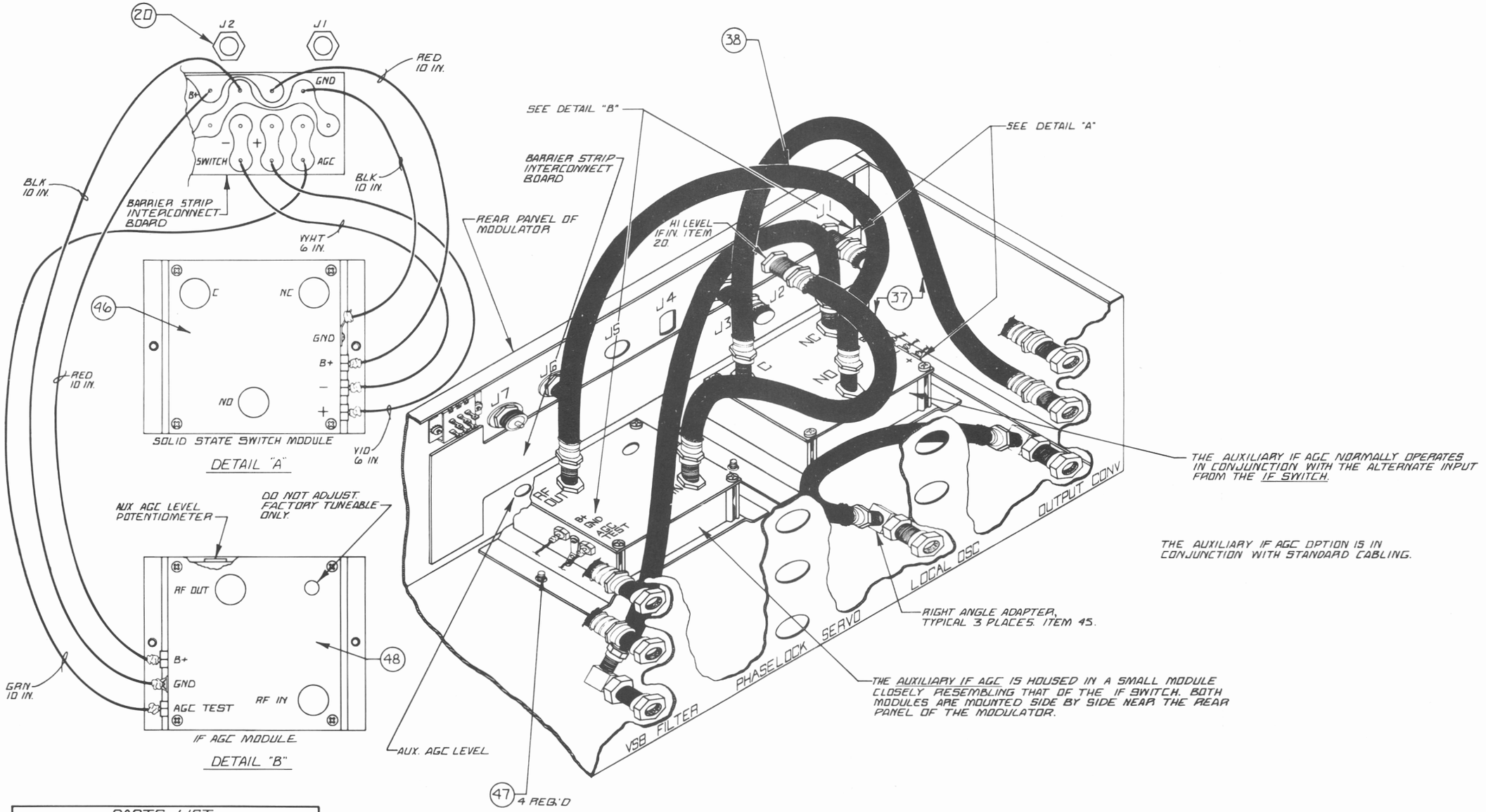


IF SWITCH IS HOUSED IN A SMALL MODULE NEAR THE REAL PANEL OF THE MODULATOR. NO ADJUSTMENTS ARE ASSOCIATED WITH THE SWITCH. ITEM 46.

THE IF SWITCH OPTION IS IN CONJUNCTION WITH STANDARD CABLING.

164235

Figure 2-5. Model 6350
IF Switch Installation Diagram

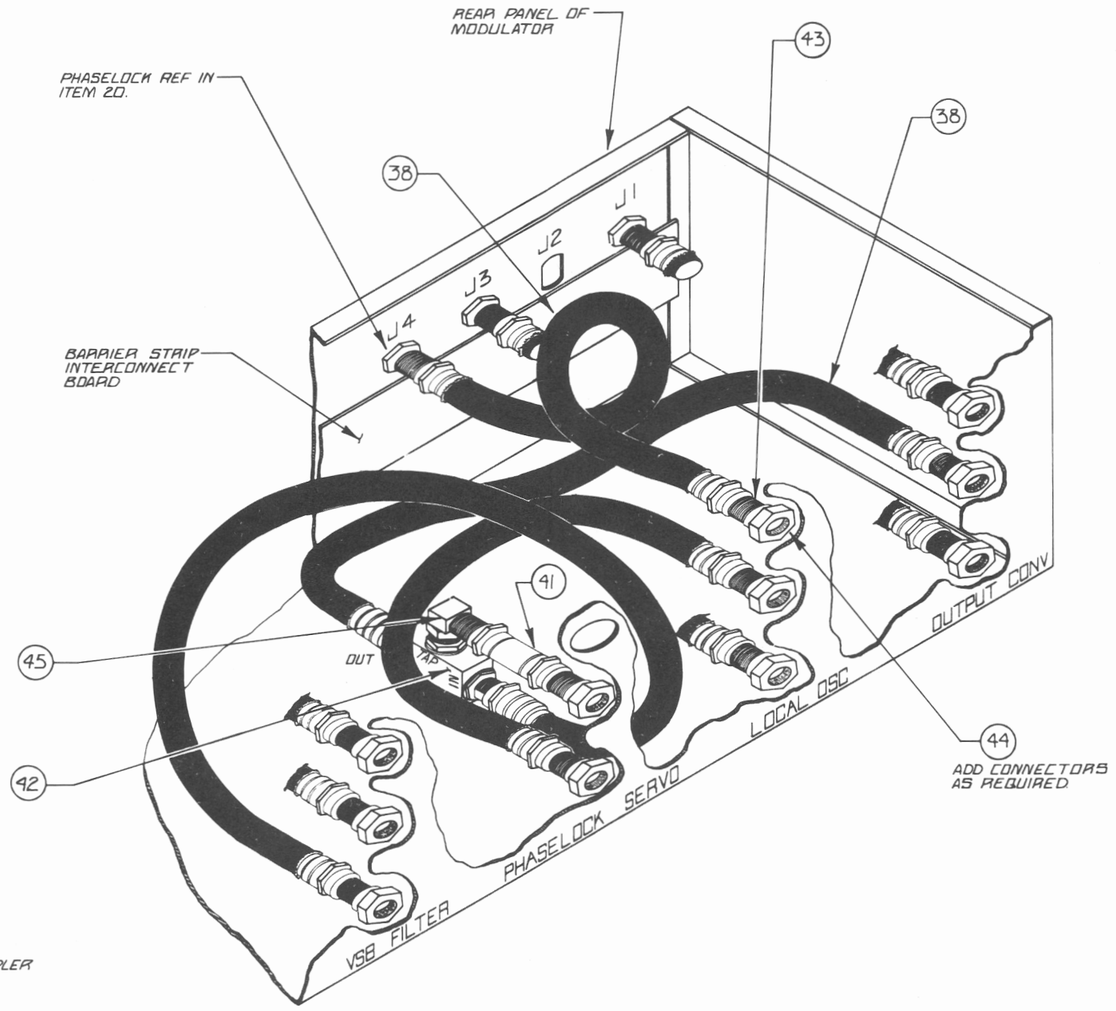


PARTS LIST		
ITEM NO.	DESCRIPTION	SA P/N
20	CONNECTOR, "F" BULLET	36200
37	CABLE, 7 IN.	36594
38	CABLE, 9 3/4 IN.	36592
45	RIGHT ANGLE ADAPTER (ELBOW)	86826
46	SOLID STATE SWITCH (MODULE)	36595
47	SCREW 4-40 x 1/4	72317
48	IF AGC MODULE	162610

164236

Figure 2-6. Model 6350 Auxiliary IF AGC Installation Diagram

PARTS LIST		
ITEM NO.	DESCRIPTION	SA P/N
20	CONNECTOR "F" BULLET	36200
36	CABLE, 6 1/4 IN.	36591
38	CABLE 9 3/4 IN.	36592
41	CONNECTOR "F" MALE TO "F" MALE	81516
42	DIRECTIONAL COUPLER 10 DB	82740
43	CHASSIS CONNECTOR "F" FEM	
	TO MALE PUSH ON	82370
44	NUT	36139
45	RIGHT ANGLE ADAPTER (ELBOW)	86826



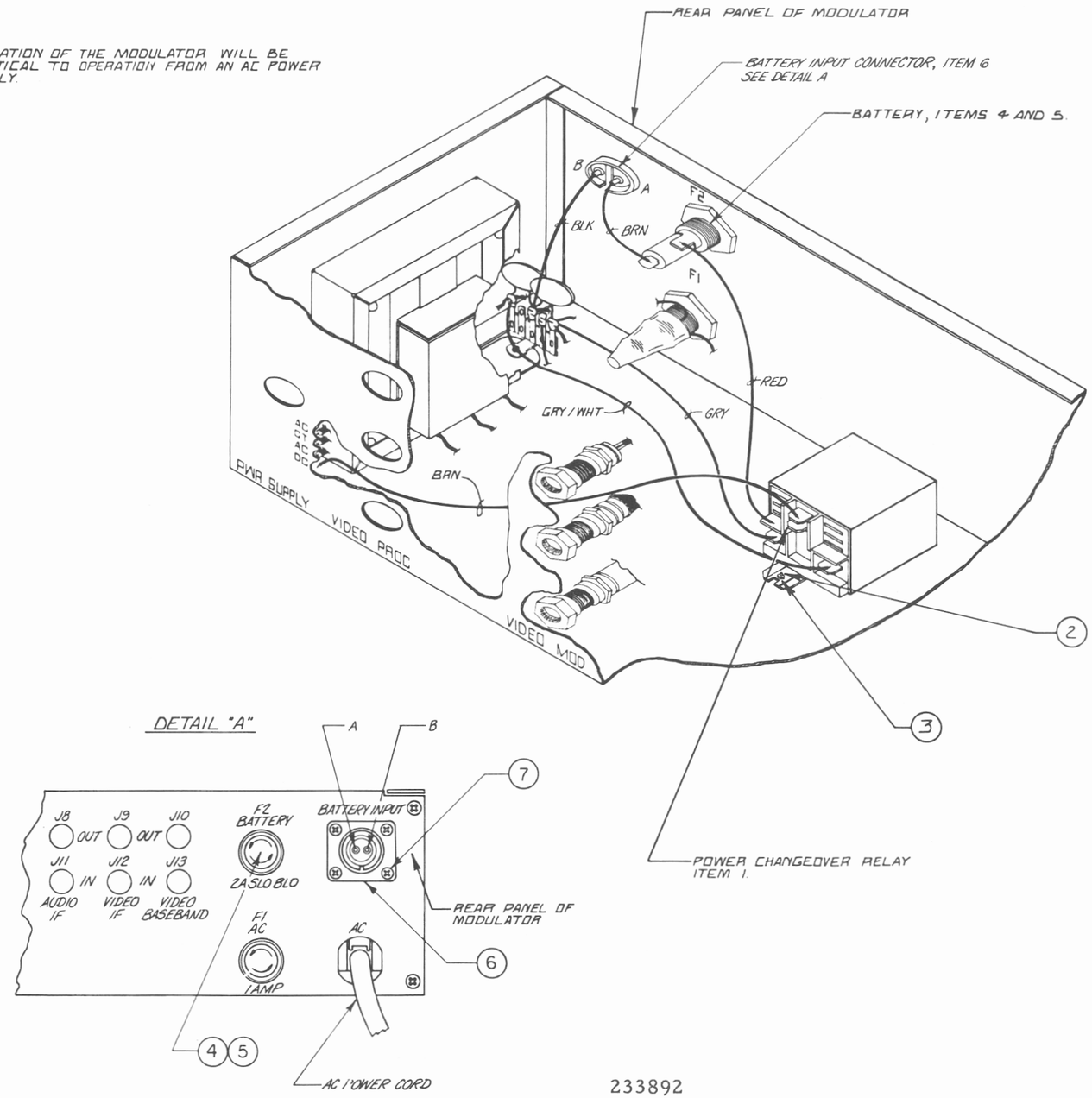
PHASELOCK OPTION IS IN CONJUNCTION WITH STANDARD CABLING. NO ADJUSTMENTS NECESSARY.

IN SOME CASES, ADDITIONAL OPTIONS MAY BE SUPPLIED, OR STYLES OF DIRECTIONAL COUPLERS USED, WHICH PROHIBIT INSTALLATION AS SHOWN. ALTERNATE PLACEMENT OF THE DIRECTIONAL COUPLER IS ACCEPTABLE, AS LONG AS WIRING IS CORRECT.

164237

Figure 2-7. Model 6350 Phase Lock Option Installation Diagram

OPERATION OF THE MODULATOR WILL BE IDENTICAL TO OPERATION FROM AN AC POWER SUPPLY.



233892

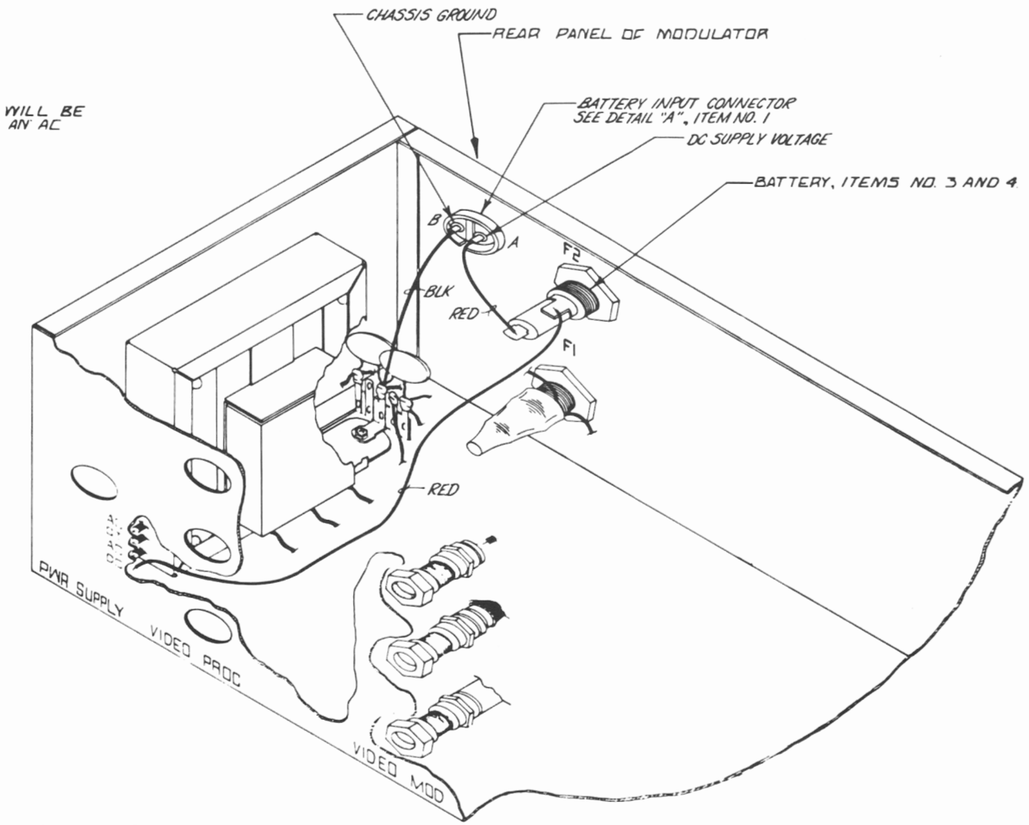
PARTS LIST		
ITEM NO.	DESCRIPTION	SA P/N
1	POWER CHANGEOVER RELAY	82760
2	SCREW, 4-40 X 5/16	72319
3	NUT, FLEXLOCK	71496
4	FUSE HOLDER	71249
5	FUSE 2 AMP SLO BLO	71224
6	CONNECTOR 3102A 12S 3P	70869
7	SCREW, 4-4 1/4	82756

REFER TO MANUAL SECTIONS 3.5 AND 3.8.9 FOR PROPER SET-UP PROCEDURE.

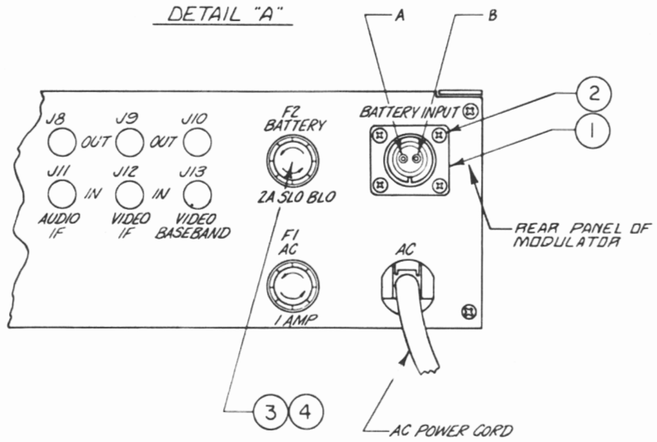
STANDARD CABLING IS IN CONJUNCTION WITH STANDBY +DC POWER OPTION. CONNECT BRN, RED, GRY, BLK, AND GRY/WHT WIRES AS INDICATED.

Figure 2-8. Model 6350 Standby +DC Powering Option Installation Diagram

OPERATION OF THE MODULATOR WILL BE IDENTICIAL TO OPERATION FROM AN AC POWER SUPPLY.



DETAIL "A"



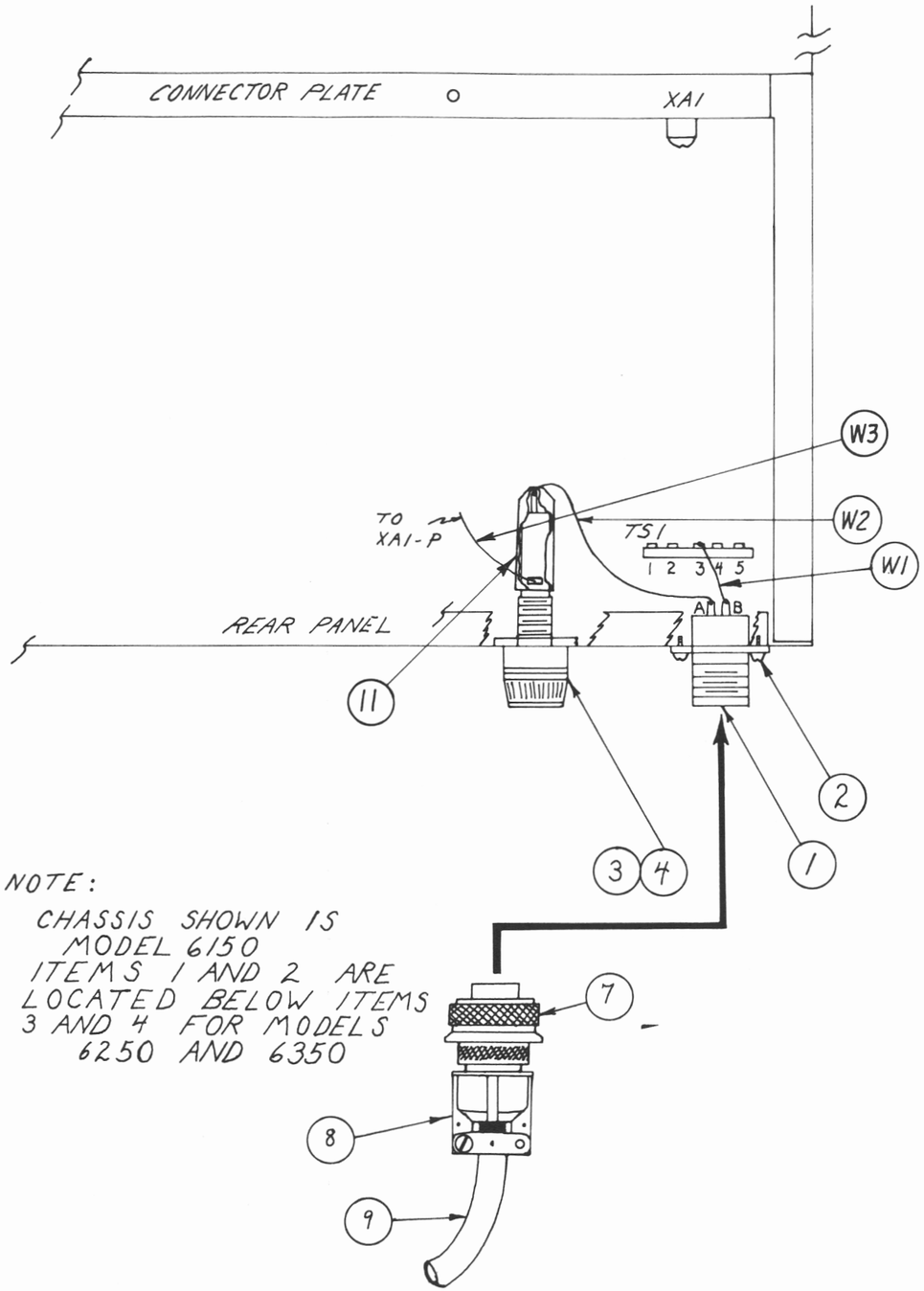
STANDARD CABLING IS IN CONJUNCTION WITH THE NEGATIVE DC POWER OPTION. CONNECT RED AND BLK WIRES AS INDICATED.

233891

PARTS LIST		
ITEM NO.	DESCRIPTION	SA P/N
1	CONNECTOR 3102A 12S 3P	70869
2	SCREW, 4 X 4-1/4 TYPE AB	82756
3	FUSE, 3 AMP SLO BLO	71228
4	FUSE HOLDER	71249

REFER TO INSTRUCTION MANUAL SECTIONS 3.5 AND 3.8.10 FOR PROPER SET-UP PROCEDURE.

Figure 2-9. Model 6350
Negative Battery Powering Option
Installation Diagram



ITEM OR FIND NO.	QTY REQD	S–A STOCK NO.	NOMENCLATURE OR DESCRIPTION	MATL SPEC AND SIZE OR COMPONENT VALUE	IDENTIFYING OR PART NO.	CODE IDENT.
11	1	75930	HEAT SHRINK TUBING	.500 ID		
W3	1	230893	WIRE, BROWN	20 GA., 9.0 IN.		
9	1	78102	BUSHING	RUBBER	#4	
8	1	70774	CLAMP		MS 3057-4A	
7	1	70942	CONNECTOR	MS TYPE	3106A 12S 3S	
W2	1	230893	WIRE, RED	20 GA., 10.0 IN		
W1	1	230893	WIRE, BLACK	20 GA., 5.0 IN		
4	1	71249	FUSE HOLDER			
3	1	71228	FUSE	3 AMP SLO BLO		
2	4	82756	SCREW	4x 1/4 PAN HD		
1	1	70869	CONNECTOR	MS TYPE	3102A 12S 3P	

PARTS LIST

162667C

Figure 2-11. Model 6350
DC Converter Option Assembly

SECTION 3
OPERATION

3.1 GENERAL

This section contains the basic operating instructions and procedures for the Model 6350 Modulator.

3.2 FRONT-PANEL CONTROLS, INDICATORS, AND TEST POINTS

Table 3-1 identifies and lists the function of the front-panel controls, indicators, and test points available on the standard configuration without options. Reference should be made to figure 3-1 which shows the location of the controls, indicators, and test points.

TABLE 3-1. FRONT-PANEL CONTROLS, INDICATORS, AND TEST POINTS

Control/Indicator/Test Point	Function
POWER SUPPLY	
POWER ON Switch	Controls application of power to the modulator when using either ac supply or battery
Power Supply Lamp	Solid state lamp illuminates when power is applied to modulator
Test Points	+20V and GND test points connected to regulated supply bus
VIDEO MODULATOR	
WHITE CLIP (lamp)	Illuminates if modulation depth control is advanced too far, resulting in peak white clipper operation
MODULATION DEPTH	Screwdriver-adjust potentiometer to adjust depth of video modulation

TABLE 3-1. FRONT-PANEL CONTROLS, INDICATORS, AND TEST POINTS - continued

Control/Indicator/Test Point	Function
METER MODULE	
AUDIO/B+/VIDEO Switch	Rocker switch to select meter function
Meter	Indicates video depth of modulation, B+ voltage, and audio deviation. Video modulation depth is indicated on the left scale. Normal modulation depth occurs when the meter pointer is in the green block near the top of the scale. Note that the meter reading will fluctuate with picture content. Normal B+ indication is with the meter pointer in the green block 40% up the left scale. Audio deviation is indicated on the right-hand scale. The meter movement is of the peak indicating type and indicates true deviation peaks regardless of the waveform.
AUDIO MODULATOR	
OVERDEVIATION	Lamp flashes when deviation exceeds approximately 26 kHz
DEVIATION	Screwdriver-adjust potentiometer to set deviation of audio carrier. The DEVIATION control adjusts the sensitivity over a 20-dB range. The modulator is normally supplied so that full deviation may be obtained with input signal levels between -10 dBm and +10 dBm. This range may be altered if necessary, as described in paragraph 3.7.2
SOUND CARRIER LEVEL	Screwdriver-adjust potentiometer which sets the sound carrier level relative to picture carrier level. Once this adjustment is made, the sound carrier level will track changes in the video carrier level.

TABLE 3-1. FRONT-PANEL CONTROLS, INDICATORS, AND TEST POINTS - continued

Control/Indicator/Test Point	Function
AUDIO MODULATOR - continued	
AUDIO and GND Test Points	Provide sample of audio signal after pre-emphasis. Level is approximately 6 volts peak-to-peak for 25-kHz deviation. Source resistance is 4.7 kΩ.
VESTIGIAL FILTER	
VIDEO CARRIER	Screwdriver-adjust potentiometer to set output RF level. Sound carrier level will track video carrier level.
OUTPUT CONVERTER	
-20 dB TEST	RF connector signal is at output channel, 20 dB below output level.

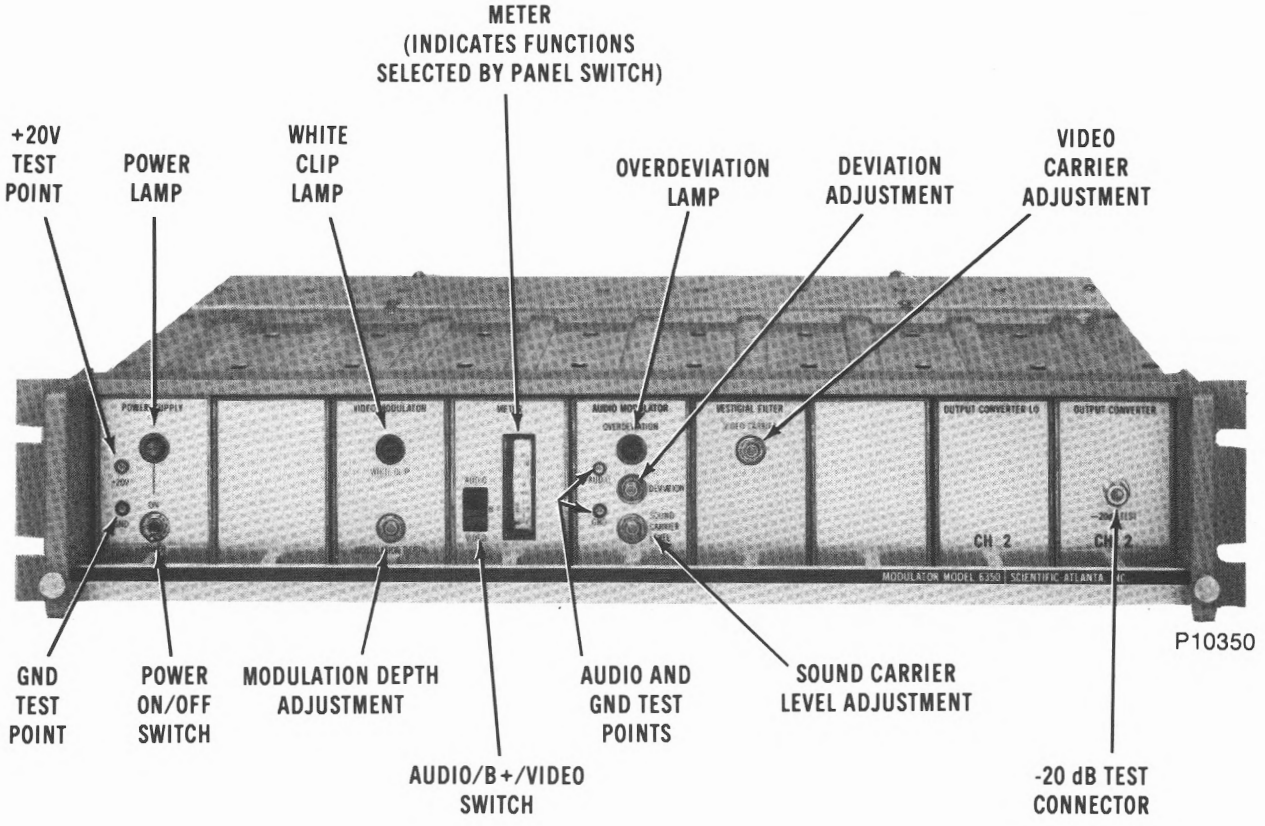


Figure 3-1. Front-Panel Controls and Indicators

If the video switch option is provided, the blank module between the power supply and the video modulator will be replaced by one having video and ground test points and a lamp which illuminates when the main video is lost. If the video AGC option is furnished, this module will have the test points, a switch to select either the AGC mode or manual gain mode, and a manual gain adjustment potentiometer. If the combination video switch/AGC option is furnished, all of the above controls, indicators, and test points will be furnished.

If the phase lock option is furnished, the output converter local oscillator is replaced with a phase lock output converter local oscillator and the blank module to its left is replaced with a phase lock servo module. This module has a lamp which is illuminated when a phase lock condition exists.

3.3 REAR-PANEL RF CONNECTIONS

Table 3-2 identifies and lists the function of the rear-panel RF connectors. Reference should be made to figure 3-2 which shows the location of the RF connectors.

TABLE 3-2. REAR-PANEL RF CONNECTORS

Connector No./Nomenclature		Function
J1	RF OUT	RF output
J2	HI LEVEL IF IN	If an IF switch is provided, an IF signal on J2 will be connected to the output converter when the switch is activated. If the auxiliary AGC is not provided, the signal level on J2 should be 18 dB below the desired output level. If the auxiliary AGC is provided, the signal level supplied to J2 should be -28 ±10 dB from the desired output level.
J3	IF OUT	Composite (picture plus sound) IF output at fixed level of approximately +42 dBmV. This output should be terminated if not used.
J4	PHASELOCK REF IN	When the phase lock option is provided, the reference signal should be supplied to J4. Level should be -10 dBmV to +40 dBmV.
J5	ALTN VIDEO IN	If the video switch option is provided, the alternate video signal should be supplied to J5. This signal will be selected when the main video signal is lost, or when terminal 5 on the barrier strip is actuated. Input impedance is 75 ohms.
J6 & J7	MAIN VIDEO IN	Loop-through main video input. The two connectors are in parallel. Either one may be used for the input. If the loop-through feature is used, the other connector may be used as a video output. In this case the termination to the right of J7 should be OUT. If the loop-through feature is not used, the termination switch should be IN.
J8	AUDIO IF OUTPUT	Supplied with DIFL and DIFL/VL options for connection to a scrambler. The sound IF output from the audio modulator module appears here. If a scrambler is not used, a jumper cable must connect between J8 and J11.

TABLE 3-2. REAR-PANEL RF CONNECTORS - continued

Connector No.	/Nomenclature	Function
J11	AUDIO IF IN	Supplied with DIFL and DIFL/VL options for connection to a scrambler. The sound IF signal from the scrambler re-enters the modulator at J11 and then connects to the sound IF input of the vestigial filter.
J9	VIDEO IF OUT	Supplied with DIFL and DIFL/VL options for connection to a scrambler. The video IF signal from the video modulator module appears here. If a scrambler is not used, a jumper cable must connect between J9 and J12.
J12	VIDEO IF IN	Supplied with DIFL and DIFL/VL options for connection to a scrambler. The video IF signal from the scrambler re-enters the modulator at J12 and then connects to the video IF input of the vestigial filter.
J10	VIDEO BASEBAND OUT	Supplied with DIFL/VL option for connection to a scrambler. The video switch or video switch/AGC modules select either of two video inputs. The selected video signal is then routed to J10 for connection to the scrambler for timing purposes. If a scrambler is not used, a jumper cable must connect between J10 and J13.
J13	VIDEO BASEBAND IN	Supplied with DIFL/VL option for connection to a scrambler. The baseband video signal from the scrambler re-enters the modulator at J13 and then connects to the video input of the video modulator.

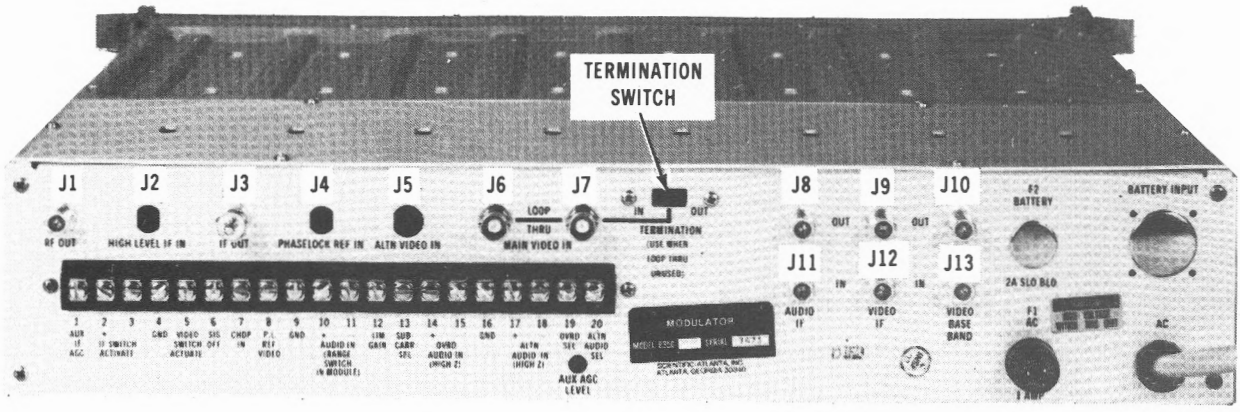


Figure 3-2. Rear-Panel RF Connectors and Barrier Strip

3.4 REAR-PANEL BARRIER STRIP CONNECTIONS AND TEST POINTS

Table 3-3 identifies and lists the function of all terminals on the 20-position rear-panel barrier strip. Reference should be made to figure 3-2.

TABLE 3-3. REAR-PANEL BARRIER STRIP CONNECTIONS AND TEST POINTS

Terminal		Description
1.	AUX IF AGC	When the auxiliary IF AGC is used, a voltage on this terminal indicates the attenuation of the AGC circuit. A more positive voltage indicates more attenuation (i.e., less gain).
2, 3.	IF SWITCH ACTIVATE +, -	When the IF switch is used, a positive voltage between 5 and 20 volts applied between terminal 2 and ground will cause the switch to activate. The switch presents a 7.7 kΩ load. A contact closure from terminal 3 to ground will also cause switch activation. The equivalent open circuit source is +10V in series with 24.5 kΩ.
4.	GND	Chassis ground

TABLE 3-3. REAR-PANEL BARRIER
STRIP CONNECTIONS AND TEST POINTS - continued

	Terminal	Description
5.	VIDEO SWITCH ACTUATE	When the video switch option is used, grounding this terminal will cause the switch to select the alternate video even though the main video is present. The equivalent source is 17V in series with 3.9 kΩ.
6.	SIG OFF	When alternate video is selected with the video switch option, the voltage on this terminal changes states. The sense of the voltage depends upon switch programming, as described in paragraph 3.8.1.
7.	CHOP IN	If the modulator with video AGC option is used following a Scientific-Atlanta Model 6250 demodulator at the same site, and it is desired to use the zero chopper, this terminal should be connected to terminal 10 on the demodulator. This permits the AGC to operate normally when receiving chopped video. Note that this would not be a normal operational mode because chop signals should not be included in transmitted video.
8.	P.L. REF VIDEO	If the phase lock option is used with modulated reference, video modulation from the reference is on terminal 8. This may be used to gen-lock local origination equipment, to eliminate moving sync bars in the background. See paragraph 3.8.8.
9.	GND	Chassis ground
10, 11.	AUDIO IN	Main baseband audio is supplied to these terminals. A balanced input is used so terminals 10 and 11 may be used interchangeably. See paragraph 2.3.2. At mid frequencies, a positive-going voltage on terminal 10 results in the RF sound carrier going higher in frequency. Normally, a 600-ohm impedance is presented between terminals 10 and 11, but this may be field modified to be a high impedance bridging input (see paragraph 3.7.3).

TABLE 3-3. REAR-PANEL BARRIER
STRIP CONNECTIONS AND TEST POINTS - continued

Terminal		Description
12.	LIM GAIN	When the audio modulation limiter option is used, a voltage on this terminal is proportional to the amount of compression, roughly following the equation $C = \frac{V - 0.5}{.06}$ where C is compression in decibels and V is in volts. Source impedance is approximately 33 kΩ. Grounding this terminal will defeat the limiter.
13.	SUBCARR SEL	Grounding this terminal places the audio modulator in the mode to accept sound on a 4.5-MHz subcarrier. The equivalent source is 15V in series with 470 kΩ.
14, 15.	OVRD AUDIO IN	Override audio is supplied to these terminals in conjunction with the audio switch option. Grounding terminal 19 causes the override audio to be selected. This input is balanced, high impedance bridging. The audio frequency response is shaped for maximum voice intelligibility and reduced line noise. A mid-frequency positive-going signal on terminal 14 causes the RF sound carrier to go higher in frequency.
16.	GND	Chassis ground
17, 18.	ALTN AUDIO IN	When the audio switch option is used, audio from the alternate source is supplied to these terminals. A high impedance balanced input is used. Grounding terminal 20 causes alternate audio to be selected. At mid frequencies, a positive-going voltage on terminal 17 results in the RF carrier going higher in frequency.
19.	OVRD SEL	Grounding terminal 19 causes the override audio on terminals 14 and 15 to be selected. The equivalent source is 10V in series with 22 kΩ.

TABLE 3-3. REAR-PANEL BARRIER
STRIP CONNECTIONS AND TEST POINTS - continued

20.	ALTN AUDIO SEL	Grounding terminal 20 causes selection of the alternate audio on terminals 17 and 18. The equivalent source is 10 volts in series with 470 kΩ.

3.5 BATTERY INPUT CONNECTOR

When either +dc standby powering or -dc operation is used, the dc power is supplied on this connector. In either case, pin B is chassis ground and pin A is the dc supply voltage.

CAUTION

Before connecting dc power, be sure that the correct power supply is plugged in on the left side of the chassis. Failure to do so may result in damage and voiding the warranty.

If positive dc standby powering is used, the normal POWER SUPPLY module should be utilized. If negative dc powering is used, a DC CONVERTER module is installed.

3.6 INITIAL SETUP

The following procedure may be followed in initially operating the modulator. Supply baseband video to connector J6 or J7. If baseband audio is to be used, connect the audio to terminals 10 and 11 of the barrier strip. If audio is on a 4.5-MHz subcarrier with the video input, connect barrier strip terminal 13 to ground (terminal 16). Depress the lower panel on the meter function switch to select video modulation. Advance the MODULATION DEPTH control on the video modulator module until the meter indicates in the green block near the top of the scale. If the MODULATION DEPTH control is advanced too far, the WHITE CLIP on the video modulator will illuminate. This indicates excessive video modulation, which can be corrected by reducing the setting on the MODULATION DEPTH control. If a meter is not furnished, use the WHITE CLIP lamp to set modulation depth.

If baseband audio is being supplied on terminals 10 and 11 of the rear-panel barrier strip, the following procedure should be used to initially set audio depth of modulation. If the meter is available, depress the top panel of the meter selector switch to select the audio metering function. Advance the DEVIATION control on the front of the audio modulator until the meter deflects to the green block on the right-hand scale (center of the meter), on peaks of the audio waveform. Note that the meter is a peak reading type indicator and so will indicate the peaks of the audio. If the deviation exceeds 25 kHz, the OVERDEVIATION lamp on the front of the modulator will flash. This may be used to set the approximate depth of modulation if the meter is not supplied. Simply advance the deviation control until the OVERDEVIATION lamp flashes. Then back off slightly. Note that in normal operation, the OVERDEVIATION lamp may flash occasionally, indicating peaks that slightly exceed 25 kHz. This generally is not considered an improper operating point unless the peaks occur frequently.

If audio is being supplied as a 4.5-MHz subcarrier with the video signal, then terminals 13 and 16, or alternatively 13 and 9, of the rear-panel barrier strip should be strapped together using a short jumper (supplied).

This programs the audio module to accept a 4.5-MHz signal from the video module and to process it through as the sound signal. In this case, the DEVIATION control on the front of the audio modulator will have no effect. Also, the OVERDEVIATION lamp will not indicate overdeviation of the audio signal. However, the meter module will indicate deviation on the audio signal being handled.

Set the output level of the modulator as desired, using a signal level meter or a spectrum analyzer. The VIDEO CARRIER control on the front of the vestigial filter module controls both the amplitude of the video carrier and simultaneously controls the amplitude of the sound carrier, so that the two amplitudes track each other. The relative amplitude of the sound carrier with respect to the picture carrier is determined by the SOUND CARRIER LEVEL control on the audio modulator. When switching between baseband audio and 4.5-MHz audio subcarrier, no change in sound carrier amplitude will be experienced.

3.7 INTERNAL SETUP OPTIONS

Three setup options are available within the modulator. These are normally supplied as required for most applications. In unusual circumstances it may be necessary to perform one of the operations described in paragraph 3.7.1 through 3.7.3.

3.7.1 4.5-MHz TRAP

When using a combined picture and sound subcarrier input, and if the sound subcarrier level is excessively high, it is possible to introduce some FM-to-AM conversion on the sound carrier. In most applications this should not prove to be a serious problem, but in a few applications, could be a limiting factor in performance. Also, if the subcarrier level is too high, the possibility exists of generating a color-sound intermodulation product in the video signal. If either of these conditions exist, a switch in the video modulator module may be activated to reduce the amplitude of the sound carrier component on the picture signal. This reduction in amplitude occurs after the point at which the sound subcarrier

is taken off to go to the audio module. In order to reduce the amplitude of the sound subcarrier, remove the video modulator module and remove the top cover from it. The top cover is the one most removed from the printed-wiring fingers on the rear of the module. Approximately one-third of the way back from the front of the module is a toggle switch. If this toggle switch is moved to the position nearest the housing, a trap at 4.5 MHz is switched into the video signal path. If the switch is moved toward the center of the module, this trap is switched out. Under normal operation, it is recommended that the trap be switched out and only switched in if the above problems are noted in the modulator performance.

3.7.2 AUDIO INPUT RANGE

The modulator as normally supplied accepts an audio signal at an amplitude between -10 dBm and +10 dBm. Should it not be possible to adjust the DEVIATION control on the audio modulator to obtain 25 kHz deviation, then the top cover from the audio modulator should be removed, exposing a rocker switch near the front of this module. This rocker switch may be moved to either extreme position as indicated on the pw board, to shift the window of acceptable signal strengths either up or down by 15 dB. Depress the switch toward the rear of the module to accept a lower amplitude (-25 to -5 dBm) input. Depress the switch toward the front of the module to select an amplitude range of +5 to +25 dBm.

3.7.3 AUDIO INPUT IMPEDANCE

Normally the audio input is 600 ohms, determined by two resistors on the input. If a high impedance (bridging) input is desired, resistors R1 and R2 may be removed. These are shown in the upper left corner of the audio modulator printed-wiring board assembly, figure 8-8. Resistor R1 is partially obscured in the module by the SOUND CARRIER LEVEL potentiometer. These resistors may be removed from the circuit by unsoldering or clipping the leads close to the housing.

3.8 OPTIONS SETUP PROCEDURE

3.8.1 VIDEO SWITCH

The video switch option permits an indication of loss of primary video and permits the switching to an alternate source of video if this primary video is lost. No setup adjustments are required to use the video switch option. The option is contained within the video switch module which, if supplied, is located between the power supply and the video modulator modules. A lamp on the front panel of the video switch module will illuminate after a 10-second delay if the main video is lost. If desired, an alternate source of video may be supplied on connector J5 on the rear panel of the modulator. This video source is terminated regardless of the position of the video switch. If an alternate source of video is provided on J5, 10 seconds after loss of main video, the alternate video source will be selected. The MAIN VIDEO OFF lamp on the front of the module will also illuminate.

Several options exist to permit the sound signal to follow the video signal. If the sound for both the main and alternate video inputs is being supplied as a 4.5-MHz subcarrier combined with the video, then no action is necessary to ensure that the sound follows the video. All that is necessary in this case is for terminal 13 of the barrier strip to be strapped to either terminal 9 or terminal 16, both of which are ground terminals. If the sound for the main video input is supplied as a baseband signal, and the sound for the alternate video input is supplied as a subcarrier combined with the video, strap terminal 13 to terminal 6 on the rear-panel barrier strip. Verify that the brown wire in the video switch module is on point A as shown in figure 3-3.

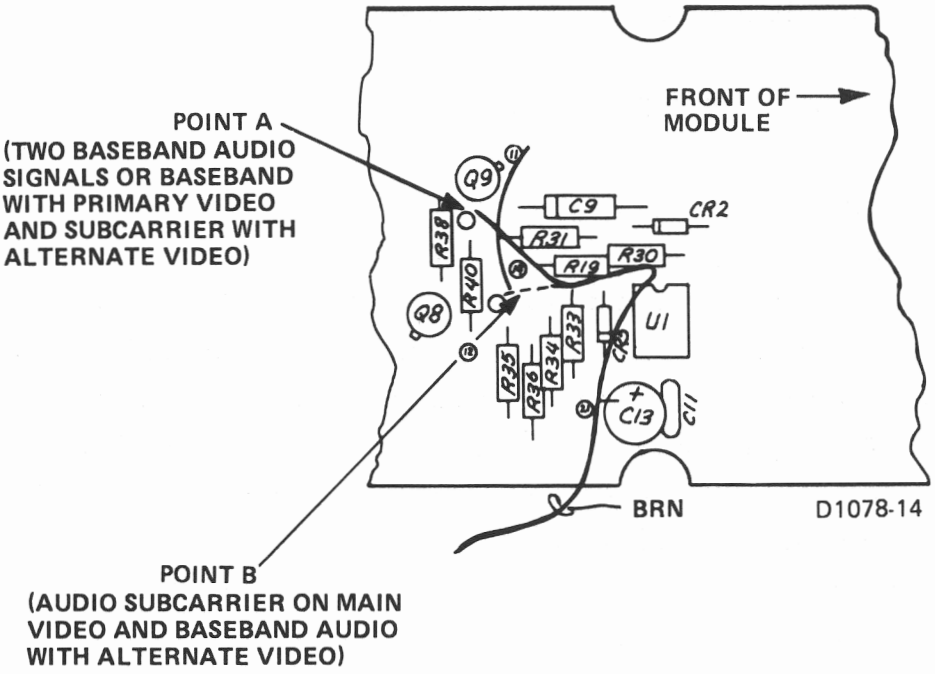


Figure 3-3. Video Switch Programming

If both the main video input and the alternate video input are accompanied by baseband audio signals, it will be necessary to use the audio switch option which is installed in the rear compartment of the modulator. In order to use the audio switch option, supply the audio that goes with the main video input to terminals 10 and 11 on the rear-panel barrier strip and supply audio that accompanies the alternate video input to terminals 17 and 18. Automatic selection of the desired audio signal will take place if terminal 6 is strapped to terminal 20 on the barrier strip. Verify that the brown wire in the video switch is at point A as shown in figure 3-3.

3.8.2 VIDEO AGC

If the video AGC option is provided, it will be housed in the module between the power supply and the video modulator just as the video switch was. During normal operation the video AGC is operated with the switch on the front panel in the AGC position. Setting the switch to the MANUAL position permits the video depth modulation to be adjusted from

the front panel control, but defeats the operation of the AGC. When using the video AGC option, supply a video signal to the modulator and adjust the depth of video modulation normally as described in paragraph 3.6. Then as the sync tip to white video amplitude varies between 0.5V and 2V, the depth of modulation will remain constant. Note that the video AGC operates only by monitoring the sync tip amplitude, therefore, modulation depth will not be affected by the maximum white level in the picture.

3.8.3 VIDEO SWITCH/AGC

Both the video switch option and the AGC option can be supplied simultaneously in the blank module between the power supply and the video modulator. When both are supplied simultaneously, the video switch is in the signal path in front of the video AGC so that the video AGC will operate on both the main and alternate sources of video. The setup procedure is the same as described in paragraphs 3.8.1 and 3.8.2.

3.8.4 AUDIO SWITCH

The audio switch option is supplied as a printed-wiring board in the rear compartment of the modulator. The audio switch option permits the use of either of two additional audio inputs to the modulator. One audio input is the alternate audio on terminals 17 and 18 of the rear-panel barrier strip. The alternate audio is normally used in conjunction with the video switch option to permit audio to follow video in a two-for-one switching application. The alternate audio input is high impedance so that if it is desired to connect the alternate audio only to this modulator and to no other loads, a 600- to 680-ohm resistor should be connected between terminals 17 and 18 along with the audio inputs. Similarly, the override audio is supplied on terminals 14 and 15 of the barrier strip. Again the override audio input is a high impedance input to permit putting several override inputs in parallel. At the end of the chain of units using the override audio input, one resistor should be placed between the terminals of the last modulator in the series.

Selection of the alternate audio is generally controlled by the video switch module. This is achieved by strapping terminal 6 of the barrier strip to terminal 20, using insulated wire. This will cause the audio switch to follow the video switch described in paragraph 3.8.1. However, it is possible to utilize the audio switch, not in conjunction with the video switch, but separately. To activate it, ground terminal 20 of the barrier strip.

Override audio input is selected by grounding terminal 19. If terminal 19 is grounded, the audio override will be coupled to the audio modulator regardless of whether main audio or alternate has been selected previously. When override is selected, the SUBCARRIER SELECT, terminal 13 on the barrier strip, must not be grounded. If terminal 13 is grounded, the override audio will not be connected to the modulator.

The alternate audio input and the override audio input may be adjusted to yield 25 kHz deviation with signal levels between -10 dBm and +10 dBm. Each input has its own deviation control on the option printed-wiring board. These adjustments may be accessed by removing the cover over the rear compartment on the modulator. The audio switch is a printed-wiring board plugged in to the motherboard containing the barrier strip. The potentiometer closest to the front of the modulator provides deviation control for the alternate audio input. When either alternate audio or override audio is selected, the DEVIATION control on the front panel is inhibited. Thus in order to set up either the alternate audio deviation or the override audio deviation, the signal should be applied to the modulator and the respective control adjusted for 25 kHz peak deviation of the associated audio.

3.8.5 AUDIO MODULATION LIMITER

The audio modulation limiter option is supplied internal to the audio modulator module as a plug-in board located near the front of the module. This board makes electrical connection with the main printed-wiring board through a 6-conductor flat cable which is plugged in to a 6-pin socket on the audio modulator printed-wiring board. No adjustments are associated with the modulation limiter. However in order to realize maximum compression, the DEVIATION control on the front of the audio modulator should be advanced as far as practical before the modulation limiter starts having an effect. The effect of the modulation limiter may be seen by connecting a voltmeter capable of reading 0 to +10 volts to terminal 12 of the rear-panel barrier strip. If the audio level is below threshold, 0 volts will appear on terminal 12. If the audio input level reaches the modulation limiter threshold, the voltage on pin 12 will jump to approximately 0.5 volt. Beyond this point the voltage will rise approximately 60 mV for every 1 dB of compression that is being introduced by the modulation limiter. When a peak occurs the modulation limiter will reduce the deviation until the peak is over, at which time the modulation limiter will return the deviation to its normal setting.

In order to realize the greatest possible compression range from the modulation limiter, it is necessary that the DEVIATION control on the front panel be advanced as far clockwise as possible. That is, the input signal level should be reduced to the point that advancing the DEVIATION control clockwise is necessary. This can be accomplished in many instances by shifting the window of the audio range as described in paragraph 2.3.2. If the DEVIATION control is set such that only on occasional modulation peaks does one read a voltage on terminal 12 of the barrier strip, then during normal programming the modulation limiter will be out of the circuit and will only act during unusual peaks. It is possible to advance the DEVIATION control further clockwise such that the modulation limiter is in the circuit most of the time. This has the effect of permitting the modulation limiter to act as a high ratio compression amplifier, not only reducing the amplitude of the program peaks, but boosting the amplitude of the weaker portions of the program.

In many instances a modest amount of compression is desirable because this tends to eliminate some undesired variation in loudness of the signal. However in some types of programming, such as classical music, modulation compression must be used with extreme care because the dynamic range is an integral part of the program material. When handling speech waveform, it is often desirable to introduce a modest amount of compression, perhaps on the order of 8 dB, during normal programming. By introducing such a modest amount of compression, a minor reduction in volume is not noticed by the listener, but a pause in speech will not result in the background noise rising excessively. In addition, of course, momentary increases in the loudness of the program material will be smoothed out by the modulation limiter.

If a VU meter is used in the audio program chain prior to the modulator, it will indicate much differently from the deviation meter on the modulator. The reason for this is that the standard VU characteristic does not respond to instantaneous peaks in the program material, but rather responds to roughly the rms value of the audio waveform over some short length of time. In contrast, both the meter on the modulator and the modulation limiter respond to instantaneous peaks in the program material. For example, if the audio system is set up such that a 0-dB reading on a VU meter corresponds to 25 kHz deviation of the modulator with a sinusoidal tone and then speech waveforms are applied to the system with the VU meter again deflecting to the 0-dB mark, one would find that the audio module was operating between 6 and 10 dB into compression with speech waveforms and generally somewhat less with music waveforms. This, again, is due to the averaging characteristic of the VU meter. When the modulation limiter is used, this permits the system to operate at a rather desirable point for most programming. This provides a few dB of compression without providing so much compression that during pauses the background noise comes up excessively, while also preventing increases in level from having an adverse effect on the listener.

3.8.6 IF SWITCH

The IF switch is housed in a small module in the rear compartment of the modulator. No adjustments are associated with the switch. It may be activated in one of two ways: by grounding terminal 3 on the rear-panel barrier strip or by applying a voltage in excess of 5 volts, but less than 20 volts to terminal 2 of the barrier strip. In either case, when the switch is activated the main IF path through the modulator is interrupted, and an alternate IF signal supplied on connector J2 on the rear of the modulator, is switched to the output converter. The IF switch may also be activated upon loss of video if the video switch option is installed. In order to activate the IF switch upon loss of main video, connect terminal 3 of the barrier strip to terminal 6 of the barrier strip. This should be done with an insulated wire. Connecting terminal 3 to terminal 6 will cause the IF switch to activate upon loss of video input. If auxiliary AGC, described in paragraph 3.8.7, is not used, the IF level in should be 18 dB below the desired output level.

3.8.7 AUXILIARY IF AGC

The auxiliary IF AGC operates normally in conjunction with the alternate input from the IF switch described above. The auxiliary AGC option is desirable when the incoming alternate IF signal cannot be maintained at a level 18 dB below the desired output. The AGC provides gain to the IF signal, provides AGC action, and provides a modest amount of bandpass filtering of the IF signal. One adjustment is associated with the auxiliary AGC, and this is the auxiliary AGC level control accessed through a small hole in the rear panel of the modulator. To adjust this control, first supply a high level IF signal to J2 on the rear panel on the modulator. The level of the signal should be nominally 28 dB below the desired output level and may vary ±10 dB from this nominal level. After supplying this signal, select the alternate IF signal by grounding terminal 3 of the barrier strip. Then adjust the AUXILIARY AGC LEVEL potentiometer, using a small screwdriver, to the desired output level. The tool used to adjust the auxiliary AGC level may be metallic. It will have no effect on the output level and it will not be possible to accidentally short out circuitry while using the tool.

3.8.8 PHASE LOCK

The phase lock option permits locking the RF picture carrier from the modulator to a reference signal, normally an off-the-air signal on the same channel as the modulator is being operated on. This is necessary if the off-the-air signal is at all strong, in order to prevent the off-air signal from causing co-channel beat in the picture. To use the phase lock option, supply a sample of the undesired off-the-air signal to the PHASE LOCK REFERENCE IN connector, J4 on the rear of the modulator. The level of the interfering signal should be greater than -10 dBmV and less than +40 dBmV. When this is done, the phase lock lamp on the front of the phase lock servo module should illuminate, indicating that phase lock has been achieved. No adjustments are associated with the use of the phase lock option.

When using the phase lock option and in the event of a strong off-the-air signal, it is possible to see in the background an image of the undesired signal. This is caused by the undesired signal leaking into the television set and adding to the desired signal produced on the cable system. This effect is most pronounced if the field rates of the two signals are not the same. If the field rates are the same, leakage would be seen as a stationary picture in the background, but if the field rates are different for the cable and off-the-air signals, then sync bars will be seen moving through the picture. This is very distracting, much more so than a stationary picture would be. In order to permit the signal generated on the cable system to operate at precisely the same field rate as the off-the-air picture, it is necessary to gen-lock the local sync generator to the off-the-air picture sync. This can be accomplished with some video equipment by supplying a sample of the interfering signal to an external synchronization or external video input port on the video sync generator. This sample of the interfering signal may be obtained from the Model 6350 modulator on terminal 8 of the barrier strip. When the phase lock option is used with an off-the-air signal, the signal on terminal 8 of the barrier strip is demodulated video from the interfering carrier. This demodulated video carries the color information to permit gen-locking color synchronization equipment as well as black and white equipment, and is at a nominal 1-volt peak-to-peak level. Note that this signal is

derived from a utility demodulator, and thus cannot be expected to be of the same quality as the signal derived from a quality demodulator such as the Scientific-Atlanta Model 6250. However, the signal does contain all of the information required for a sync generator to gen-lock the local origination signal to the interfering signal off the air.

3.8.9 STANDBY +DC POWERING

If the standby positive dc powering option has been ordered, a voltage of 24 to 28 volts dc should be applied to the battery input connector on the rear of the modulator. This interface is described in paragraph 3.5. No adjustments are associated with use of this battery input. Normally the battery will not be loaded by the modulator, but when ac power is lost, the modulator will begin drawing power from the battery and will continue to do so until ac power is restored. Operation of the modulator is unchanged in this mode and the power switch on the front panel will continue to have the same function as it does with an ac input.

3.8.10 OPERATION FROM NEGATIVE BATTERY

If the modulator is configured to operate from a negative battery supply, the normal power supply module is replaced with a dc converter. In this case, the required negative dc voltage, between 19 and 32 volts, is also applied to the battery input on the rear of the modulator as described in paragraph 3.5. Again, operation of the modulator will be identical to operation of the modulator from an ac source.

3.8.11 SPECTRUM INVERTER

The spectrum inverter is commonly used in conjunction with set-top converters that block convert mid-band channels to either the low band or high band. Caution should be exercised when ordering this option, since some converters require that the signal be not only inverted, but also offset in frequency. Consult the converter manufacturer for the exact video and audio carrier frequencies required, and order accordingly. Scientific-Atlanta will then calculate the correct crystal frequency for your application.

SECTION 4
THEORY OF OPERATION

4.1 GENERAL

This section covers the theory of operation of the Scientific-Atlanta Model 6350 television modulator. Effective troubleshooting of the modulator is not possible without a suitable understanding of the theory of operation of the unit. Therefore, it is recommended that this section be studied thoroughly before attempting to determine what module in the modulator is defective.

4.2 BLOCK DIAGRAM DISCUSSION

Figure 4-1 shows the block diagram of the modulator with options installed, but indicated as options. The text will indicate signal flow if the options are omitted.

The main video input is supplied to connector J6 or J7 on the rear of the modulator. These connectors are in parallel. A 75-ohm terminating resistor, as shown on the block diagram, may be switched in to terminate the video at this point if the loop-through feature is not used, or may be switched out if the loop-through feature is used. Loop-through would be used in those cases where it is desired to add additional video equipment following the modulator. The video signal is applied either to the video switch and/or AGC if such options are present, or if the options are not present, it is applied directly to the video modulator module. Consider first the condition in which both the video switch and the AGC options are supplied. In this case, the main video is supplied through a buffer amplifier to a video presence detector which detects the presence of video on the main input. If video is lost, a MAIN VIDEO OFF lamp on the front panel is illuminated and an internal solid state switch is transferred to accept an alternate video input. In addition, the video presence detector transmits a signal to logic on the optional audio switch to cause it to

transfer to follow the video input. From the video switch option, or directly from the input if the video switch is not supplied, the signal is applied through a buffer amplifier to the video AGC option. The video AGC option monitors the amplitude of sync pulses and adjusts the video amplitude. In so doing, the level of the active video is also adjusted so that the video depth of modulation will remain constant even if the incoming video level varies.

From the video AGC option the video signal, still at baseband and a 1-volt peak-to-peak level, is supplied to the video modulator module. A buffer amplifier in the input of this module serves to provide a high impedance termination for the video signal; and, in addition, provides a sample of the composite signal to the audio module. This sample is used by the audio module to obtain the 4.5-MHz audio subcarrier when used. From the input buffer amplifier in the video modulator, the signal is applied to a delay predistortion network which compensates for the group delay of the average home television receiver. After the predistortion network, the signal is applied to a 4.5-MHz trap if it is switched in. This trap reduces the amplitude of a 4.5-MHz subcarrier component by approximately 10 dB. The object is to reduce the effect of a high-amplitude audio subcarrier which might ride through the video modulation process and cause FM-to-AM conversion in the resultant sound carrier. From the 4.5-MHz trap, the video signal is applied to a video clamp and peak white clipper. The video clamp ensures that the sync tip voltage remains constant regardless of modulation, a condition necessary for the modulation process. The peak white clipper assures that no video signal corresponding to excessive depth of RF modulation is permitted to pass to the modulator. Should such an excessively white signal pass to the modulator, the picture carrier will, during that time of excessive white, either be cut off or possibly reversed 180° in phase. This potentially can cause serious sync buzz in the television receiver. A lamp on the front panel indicates when the peak white clipper is in operation. Normal operation of the video modulator is such that the clipping lamp is extinguished. From the clamp and the clipper the video signal is applied to the modulator along with the signal from an IF oscillator located in the video modulator module. A sample of the oscillator output is also supplied to the audio module for upconversion

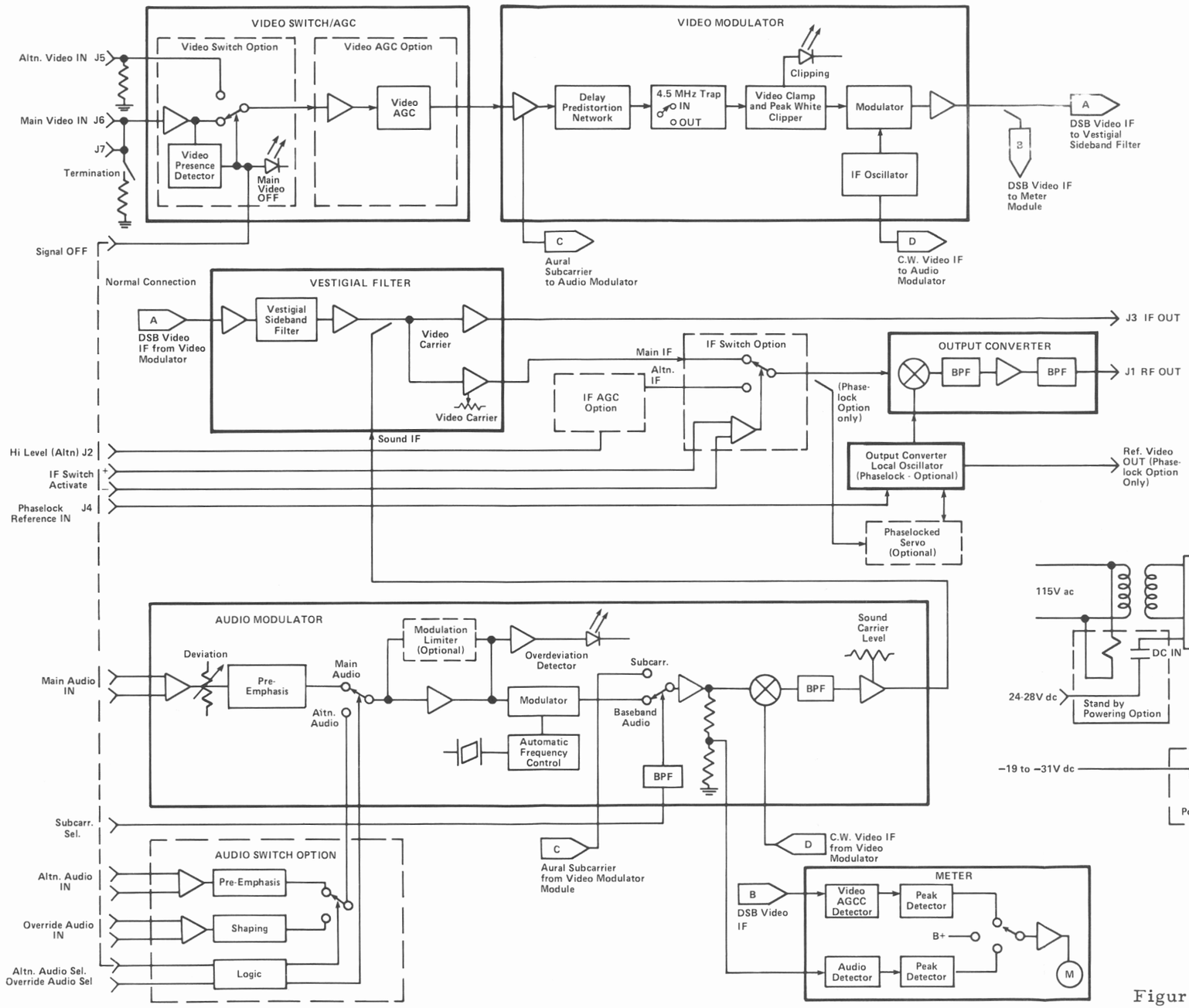


Figure 4-1. Model 6350 Television Modulator Block Diagram

of the sound carrier from the 4.5-MHz intercarrier frequency to the 41.25-MHz sound IF frequency.

Following the modulator the double sideband modulated signal is buffered and is supplied to the vestigial filter module. Before being supplied to the vestigial filter a sample of the signal is taken for the meter module. In the vestigial filter module the double sideband video IF signal is first buffered, then applied to the vestigial sideband filter. A surface acoustic wave (SAW) filter is used to permit excellent out-of-band rejection with excellent inband group delay characteristics. A second buffer amplifier following the vestigial sideband filter returns the signal to a 75-ohm level and, in addition, permits correction of minor irregularities in the SAW filter response. Sound IF is added to the vestigial sideband IF at this point. Following the directional coupler used for addition of sound IF is a splitter. One output from the splitter is supplied through a buffer amplifier to the IF output connector on the rear of the modulator. The other output from the splitter is supplied to an amplifier whose gain is controlled by the front panel VIDEO CARRIER control.

At this point, a composite vestigial sideband IF signal with sound carrier is present. If desired, an IF switch may be added at this point to permit selection of an alternate IF signal. The main IF signal, or the selected alternate if supplied, is routed to the output converter module. In this module the IF signal is mixed with the output from the output converter local oscillator to obtain the output frequency. A bandpass filter following the mixer eliminates undesired mixer products. This filter is followed by a hybrid power amplifier which in turn is followed by another bandpass filter. The output at this point is the RF output on the rear of the modulator.

Returning to the IF switching option, the IF switch shown may be activated either from an external contact closure on the minus input or from an external voltage applied to the plus input. Alternatively, the output of the video presence detector may be supplied to the plus input of the IF SWITCH ACTIVATE control and may be used to activate the IF switch when the main video signal is lost.

If the IF switch is in the ALTERNATE position, an alternate IF may be supplied from a connector on the rear panel of the modulator. This alternate IF may be supplied either directly to the switch or through the IF AGC option. If this AGC option is not supplied, the output level will be determined by the level of the alternate IF input, which should be 18 dB below the desired output. If the AGC option is supplied, the alternate IF input should be nominally 28 dB below the desired RF output level and the AGC option will compensate for a plus or minus 10-dB variation in the level of the alternate IF input. An output level control on the AGC option, which may be accessed from the rear panel of the modulator, will control the amplitude of the RF output when the IF switch is in the ALTERNATE IF position.

The output converter local oscillator block can either be a standard local oscillator or, optionally, may be a phase lock local oscillator. If the phase lock option is ordered, a phase lock reference signal must be supplied on connector J4 on the rear panel of the modulator. The phase lock output converter local oscillator operates in conjunction with the phase lock servo module to provide a local oscillator signal such that the RF output will be phase-locked to the reference. Note that in order to do this, a sample of the IF signal from the modulator must be supplied to the phase lock servo module. Normally, the IF sample is taken just before the output converter module so that phase lock may be achieved when the IF switch is in either the MAIN or the ALTERNATE IF positions. A reference video output is obtained from the phase lock output converter local oscillator and is available on the barrier strip on the rear of the modulator. This reference video output is a baseband video signal which has been demodulated from the phase lock reference input. This signal may be used to gen-lock local sync generating equipment to the interfering video source. This will eliminate the moving sync bar often seen in the background of a phase-locked channel.

Consider now the audio modulator module. The main audio input is supplied from the barrier strip on the rear panel, through an operational amplifier circuit which converts the balanced input to an unbalanced signal. Following this input stage is the pre-emphasis network. The pre-emphasis

network is used to complement the standard 75-microsecond de-emphasis used in home television receivers. Following the pre-emphasis network is a switch which is normally in the position shown to connect the main signal to the remainder of the audio circuitry. If the switch is thrown, then the input is from the audio switch option which will be discussed later. Following this switch, the audio signal is applied to another buffer amplifier stage. This stage normally serves as a peak clipper to prevent deviation from exceeding approximately 60 kHz peak. An optional modulation limiter may be placed around this stage to adjust the gain of the stage such that the output level will not exceed that required to achieve 25 kHz deviation of the audio carrier. After this stage the signal is applied to the modulator proper. Included in the modulator is a digital phase lock loop circuit which ensures that the center frequency of the modulator is always 4.5 MHz, locked to a crystal oscillator standard. Following the modulator proper is the switch that selects either baseband audio or an aural subcarrier supplied from the video modulator module. Normally the switch is in the position shown, and couples the 4.5-MHz output from the modulator to the remaining circuitry. However, if terminal 13 on the rear of the modulator is grounded, this switch will be thrown to the alternate position and will accept a subcarrier from the video modulator module. Following the switch, a sample of the 4.5-MHz subcarrier is taken to the meter module where it is demodulated for metering purposes. The remainder of the signal is upconverted to 41.25 MHz in a double-balanced mixer using the CW video IF signal supplied from the video modulator. After upconversion to 41.25 MHz, the signal is amplified and is supplied through a bandpass filter to the directional coupler in the vestigial sideband filter module.

The audio switch option permits the main audio input to be disconnected and permits either of two alternate audio sources to be selected. One of the alternate audio sources is used in conjunction with the alternate video input to perform the audio-follow-video switching requirement. This high impedance audio input is transformed from a balanced to unbalanced signal, again using an operational amplifier with precision resistors. A pre-emphasis network follows this amplifier and a switch selects either that input for transmission to the audio module or selects the override

audio input. The override input is similar to the alternate audio input except that instead of being pre-emphasized, the passband response is shaped to maximize voice intelligibility while reducing telephone line noises. Either alternate audio or override audio is selected by grounding or applying B+ to the appropriate terminal on the rear panel of the modulator. Logic inside the audio switch option controls the switch in the option and also controls the switch in the audio module to permit selection of the correct audio input.

The meter module accepts a sample of the double sideband video IF signal taken after the video modulator module. This signal is applied to an internal AGC amplifier and video detector. The baseband output from this video detector is supplied to a peak detector which is configured such that the output of the peak detector is an analog signal representing the depth of modulation of the picture carrier. The output of the peak detector is supplied through a switch to a meter amplifier and then to the meter in the module. A sample of the 4.5-MHz audio signal is supplied to a limiter and sound detector whose output is applied to a peak detector. This peak detector is configured such that the peak value of the audio signal is held long enough to permit the meter to indicate the true peak deviation of the signal. No de-emphasis is used in this module so that the metered signal truly represents the deviation of the sound carrier.

Power is normally supplied from a 115-volt ac line through a transformer to the power supply module. This module includes a rectifier, filter, and electronic voltage regulator. The voltage regulator includes electronic current limiting and overvoltage protection. In the event of a short on the B+ line, the power supply will limit current to a safe value and no damage will be sustained by the unit. Should the regulator fail, permitting the output voltage to rise to a level that could damage the modulator circuitry, a crowbar circuit inside the module will fire, blowing a fuse in the power supply, and rendering the unit inoperative. If the 24V dc standby powering option is ordered, a relay is placed across the 115V ac line. This relay is normally activated and disconnects the battery source from the power supply. In the event of loss of power, the relay drops out and connects the battery source to the power supply. Alternatively the modulator may be

powered from a source of negative dc potential using a dc/dc converter whose output is the positive 20 volts required by the modulator.

4.3 MODULE DETAIL DISCUSSION

4.3.1 POWER SUPPLY

Refer to figure 8-1, the power supply schematic diagram. The power supply module receives a source of low-voltage ac from the power transformer located in the rear compartment of the modulator. This ac is rectified and the raw dc regulated to +20 volts dc through the use of a linear IC voltage regulator driving a series-pass transistor. The IC regulator provides short-circuit protection in the form of an automatic current foldback feature. Output overvoltage protection is also provided by a crowbar circuit to protect the numerous circuits used in the modulator. When the standby battery option is ordered with the modulator, the power supply can also be fed from a source of dc from +24 volts dc to +28 volts dc. An ac-activated relay mounted in the rear of the modulator provides automatic switchover to the dc supply in the event of loss of the ac line voltage.

The center-tapped secondary of the power transformer provides a 48-volt CT (with line voltage of 117 volts ac) source which enters the power supply module on printed-wiring board connectors L, M, and N. When front-panel mounted power on-off switch S1 is in the ON position, one section of this triple-pole double-throw switch grounds the center-tap (M) connection while another disconnects filter capacitor discharge resistor R1 from ground. This allows rectifier diodes CR1 and CR2 to conduct, charging up filter capacitor C1. The third section of the power switch allows an external source of dc to be connected across filter capacitor C1 through printed-wiring board connector P, if the unit contains the standby battery option. The unregulated voltage across C1 is supplied through 2-ampere overvoltage protection fuse F1 to the collector of series-pass transistor Q1 and the B+ input of voltage regulator IC, pins 11 and 12. The regulated output on the emitter of Q1 is supplied through current-sensing resistor R8 to printed-wiring board connectors B and C. The voltage on B and C is

also connected to front-panel test point TP1 and power-on indicator LED DS1. A sample of the regulated B+ voltage is supplied via resistor-divider network R11 and R12 to pin 4 of the IC voltage regulator. This voltage is compared to an internal reference Zener diode voltage which is available on pin 6 and is supplied to voltage reference input pin 5 through resistor R4. Potentiometer R11 allows the regulated B+ voltage to be accurately set to +20 volts. The reference voltage for the current limit input is connected to pin 3 of the IC regulator chip with the current sensing input voltage being supplied to pin 2 of the chip via resistor-divider network R7 and R9. Pin 10 is the regulated output from the IC regulator and in this application, provides the base current drive needed by the series-pass transistor. Overvoltage protection in the power supply module is achieved by connecting the regulated B+ voltage through the 24-volt Zener diode, CR4, and resistor R5 to the gate of SCR CR3. If for any reason the regulated B+ voltage goes above +24 volts, the Zener conducts, firing the SCR which then blows the 2-ampere fuse.

4.3.2 VIDEO MODULATOR

Refer to figure 8-4, the video modulator schematic diagram. Incoming video is supplied on connector J1, shown on the left side of the schematic diagram. Transistors Q1 through Q3 form a buffer amplifier with a voltage gain of 2. The video output is taken from the emitter of Q3 and is supplied to buffer amplifier Q4. This buffer amplifier provides an output to the audio modulator to permit recovery of a 4.5-MHz sound subcarrier superimposed on the video signal. The output from Q3 is also applied through matching resistor R9 to the group delay pre-distortion filter. This filter compensates for the group delay of the average home television receiver. The output section of this filter, consisting of C19, L8, and associated components, is an amplitude equalizer to compensate for amplitude irregularities introduced by the delay pre-distortion filter. Resistor R20 provides the load on the filter and is returned to the emitter of Q5. Transistor Q5 and operational amplifier U1 provide an active dc load for the video signal, permitting the video to be returned to a dc level equal to the average level of the video. Video output from the delay pre-distortion filter is taken through modulation depth potentiometer R25 and

is supplied to buffer amplifier Q6. The output of Q6 is applied through bypass switch S1 to a 4.5-MHz notch filter consisting of L10, L11, and associated components. Depending upon the position of switch S1, this filter is either in or out of the circuit. From the notch filter, the video signal is supplied through isolation amplifier Q8 to the base of transistor Q10. Transistors Q10, Q13, Q14, and Q18 form a non-inverting amplifier in the dc restorer loop. The dc restorer is used to ensure that the amplitude of the sync tips is always constant. A dc signal is supplied through resistor R42 to ensure that this condition exists. Output from this buffer amplifier is on the emitter of Q18. The video signal at this point is still a negative sync signal and is applied to three different circuits. The video signal is supplied through resistor R84 to comparator amplifier U2. Here the sync tip level is compared with a reference level established on pin 1 of U2 and adjustable with R96. Should the sync tip level be too low, the right-hand transistor of the differential pair in U2 is turned on causing transistors Q20 and Q21 to charge C54 to a more positive potential. The voltage on C54 is fed back through R42 to the input of the video buffer amplifier beginning with transistor Q10. Should the sync tip level rise too high on pin 5 of U2, the right-hand transistor of the comparator will not turn on and storage capacitor C54 will discharge through R99, reducing the voltage on the base of Q10.

The second load on the output of Q18 is the peak white clipper circuit. Should the voltage on the output of Q18 attempt to rise too high, indicating excessive white content in the scene, the peak-white clipper holds the voltage to a level representing approximately 95% depth of modulation of the picture carrier. This threshold is set on the base of transistor Q19 by adjusting potentiometer R85. Should the voltage on the emitter of Q18 begir to rise above this threshold, diode CR1 and transistor Q19 are turned on, preventing the excessive voltage rise from taking place. Current drained from the emitter of Q18 through CR1 and Q19 sets up a voltage on the base of Q17, one-half of a comparator amplifier. When this happens, the voltage on the collector of Q17 is pulled low, permitting transistor Q12 to turn on. This in turn causes transistor Q9 to turn on, illuminating the WHITE CLIP LED on the front panel of the module. Hysteresis supplied through R48 ensures that the lamp will illuminate at full brightness.

The third load on the emitter of transistor Q18 is the double-balanced video modulator. This video modulator consists of four PIN diodes, CR2. The other input to the balanced mixer is from crystal oscillator Q7, shown in the lower portion of the schematic diagram. Transistor Q7 is a Colpitts oscillator circuit with crystal Y1 in the feedback. Energy is taken from the crystal oscillator across capacitor C27 and is supplied to two buffer amplifiers. Amplifier Q1 supplies the signal to connector J2 where, in turn, the picture carrier signal is supplied to the audio module to convert the 4.5-MHz intercarrier sound to the 41.25-MHz sound IF. The other buffer amplifier on the output of the crystal oscillator consists of Q15 and associated components. Its output is supplied to the double-balanced mixer along with the video signal supplied across resistor R89. The output of this mixer is a double-side band video modulation which is buffered in transistor Q22 and supplied through a low-pass filter to the module output on connector J3.

4.3.3 METER MODULE

Refer to figure 8-6, the meter module schematic diagram. Modulated double-side band video IF is supplied through connector J1 and capacitor C1, shown in the upper left corner of the schematic diagram. This signal is applied to AGC controlled RF amplifier U1 and from there to detector integrated circuit U2. The video output on pin 4 of U2 is supplied to an AGC loop consisting of transistors Q1 and Q2 and associated components. The video signal on pin 4 is a negative-going video and the AGC loop is configured such that the sync tip level is approximately 0.7-volt above ground. Q2 is the AGC detector transistor. Should the sync tip level be above the base-emitter voltage of Q2, then Q2 is always on. This results in C11 discharging towards 0V. This voltage is buffered by emitter follower Q1 and applied back to the AGC input, pin 5 of U1. As the AGC voltage drops, the gain in U1 increases, which will increase the signal at the output of U2 pin 4. As the signal level increases, the sync tip level decreases and eventually reaches the point that Q2 begins to turn off on sync tips. When this happens, the collector of Q2 rises too close to the +20V supply, charging capacitor C11. This voltage is supplied back to pin 5 of U1 as the AGC voltage. Thus, the AGC loop operates to hold the

output on pin 4 of U2 at a level such that the sync tips ride approximately 0.7-volt above ground. The video signal is supplied to calibration potentiometer R12, then through emitter follower Q3 to peak detector Q4. The video signal on the base of Q4 is clamped to a reference level through C14. Buffer amplifier U5 provides a high-impedance load to C14 and provides a low-impedance drive to the meter amplifier. When the video signal is to be metered, transistor Q5 is turned on, coupling the video signal level to the summing junction of amplifier U6B. The output of U6B is applied through a compensating network to the meter.

Audio subcarrier input to the meter module is on pin M, shown on the left side of the schematic diagram, and is applied to U3, a combination limiter amplifier and quadrature detector. The detector is tuned by C20. Audio output appears on pin 1 and is supplied through capacitor C25 to calibration potentiometer R30. The signal is then applied to a peak detector consisting of power operational amplifier U4 and associated components. The peak amplitude of the signal is held by capacitor C30 and buffered by operational amplifier U5A. When the audio is to be measured, transistor Q6 is turned on, supplying a current proportional to the voltage from C30 to the summing junction of the meter amplifier U6B.

When the B+ is to be metered, switch transistor Q8, shown next to the meter amplifier, is turned on, connecting a sample of the B+ voltage to the meter amplifier.

Selection of metering of either the video, audio, or B+ is accomplished by switch S1, shown to the left of the meter amplifier. If the switch is not set to a particular position, then the voltage on the gate of the associated field effect transistor (FET) is pulled to ground. The meter circuit operates with respect to a 10V level generated inside the module so that when the gate of the FET is pulled to ground, it is turned off. When switch S1 is set to the video position, the +10V level is supplied to the gate of Q5, permitting that FET to turn on. In addition, when the switch is in either the video or audio positions, transistor Q7, shown to the right of switch S1, is turned on. This holds the gate of transistor Q8 at 0V, holding it off. In the B+ position, switch S1 is not connected to

any switch transistor and is not connected to Q7. This permits Q7 to turn off, which in turn, turns on transistor Q8.

The +10V level required for operation of the circuit is generated by operational amplifier U6A, shown at the bottom center of the schematic. A voltage divider from the B+ line, consisting of R59 and R60, produces a 10V level at pin 3 of U6A. Operational amplifier U6A is a non-inverting unity gain buffer which provides on its output, pin 1, +10V required for the remainder of the module.

4.3.4 AUDIO MODULE

Refer to figure 8-8, the audio module schematic diagram. The audio module accepts audio input either at baseband or as a 4.5-MHz subcarrier and produces a sound IF at 41.25 MHz which is supplied to the vestigial filter module.

Incoming baseband audio is applied on pins E and F, shown near the top left corner of the schematic diagram. The audio is supplied to operational amplifier U1D, which converts from balanced audio to single-ended audio. The gain of U1 may be changed by changing the position of switch S1. In the nominal gain position, the stage exhibits a gain determined by R3, R4, R7, and R8. If the switch is set to the HIGH position, resistor R5 is placed in parallel with R8, and R6 is placed in parallel with R7. This reduces the gain of the first stage by approximately 15 dB. If the switch is set to the LOW position, R5 is placed in parallel with R3, and R6 is placed in parallel with R4. This effectively raises the gain of the input stage by approximately 15 dB. The output of this first stage is applied to the front-panel deviation control potentiometer R9. From the deviation potentiometer, the signal is applied to U1A, which provides the pre-emphasis function. Following this, the audio is applied through resistor R15 to transistor switch Q1. In normal operation, transistor Q1 is turned on and R15 is connected to the summing junction of U1C. This section provides high gain, determined by the feedback resistors R20, R22, and R23, as well as the input summing resistor R15. In addition, if the modulation limiter

option is installed, it appears in the feedback around this stage. The modulation limiter operates such that there is effectively an open circuit between pin 5 and pin 3 of the limiter until the amplitude of the audio signal on pin 5 of the modulation limiter reaches a threshold. Above this threshold, the modulation limiter effectively places a feedback resistor between pins 3 and 5 that reduces the gain of this stage in whatever amount is required to hold the output signal to approximately 6V p-p.

When the audio switch module is installed, it controls the switching function of transistor Q1 through a signal supplied on pin M of the printed-wiring board connector. Normally, pin M is open, but when either the override audio or the alternate audio is selected, the audio switch option pulls pin M to ground. This turns off Q1, interrupting the path from the main audio. The audio switch supplies the auxiliary input on pin N, shown in the top left corner of the schematic diagram. Pin N is an extension of the summing junction from the third amplifier stage and is connected to a switch on the auxiliary audio card. Output from U1C is supplied to the audio test point on the front panel and through C8 to the OVERDEVIATION threshold detector. The last function is performed by U1B, with the threshold being determined by resistors R26, R28, and R31. Should the voltage on pin 6 of the amplifier exceed that on pin 5, the output on pin 4 goes positive. This turns on transistor Q2, which in turn, illuminates the OVERDEVIATION lamp on the front panel. In addition, capacitor C10 is charged, permitting the transient that illuminated the LED to be stretched, holding the LED on longer.

The audio is also supplied through capacitor C9 to deviation sensitivity potentiometer R29 and from there to the oscillator circuit shown just below and to the right of R29. The 4.5-MHz intercarrier oscillator consists of transistors Q3 and Q4 and associated components. The circuit is a negative resistance oscillator such that effectively a negative resistance is in parallel with L1, C14, and CR9, the frequency determining components. Modulation is applied to the lower end of varactor diode CR9. A frequency correction signal from a phase lock loop is applied through R41 to the high end of diode CR9. Energy is

taken from the oscillator circuit from a voltage divider on the source of transistor Q4.

The 4.5-MHz modulated signal is buffered by transistor Q5. A signal having a large voltage swing appears on the collector of Q5 and is supplied to integrated circuit U2. This integrated circuit is a CMOS multi-stage divider which divides the 4.5-MHz frequency down to a suitable low frequency for application to phase detector U4. The other signal applied to the phase detector comes from divider U3. The input to U3 is from a crystal oscillator consisting of two sections of integrated circuit U5 and crystal Y1. Crystal oscillator Y1 oscillates at 1/4 the frequency of the 4.5-MHz oscillator and its output is divided down by U3 to become the second input to the phase detector. The output of the phase detector is on pin 13. Resistors R51 through R53 and capacitors C23 and C24 form a compensation network for the phase lock loop and the correction voltage appearing at the junction at R51 and C23 is supplied back to the high end of varactor diode CR9. Thus, if the center frequency of the oscillator deviates from 4.5 MHz, the phase lock loop acts to restore the center frequency to 4.5 MHz.

The other output from buffer amplifier Q5 is a low impedance, low amplitude signal on the emitter which goes to a diode switch, shown on the left side of the schematic diagram. For operation with a baseband audio input, diode CR11 in the switch is turned on. This couples the 4.5-MHz signal from the emitter of Q5 to limiter amplifier U6. The output of the limiter appears on pin 5 of U6 and is supplied through a lowpass filter consisting of capacitors C37 and C38 and inductor L5. A sample of the output signal is taken through voltage divider R61 and R60 and is supplied as the subcarrier signal to the meter module. Additional energy is taken from the limiter through divider R62 and R64 and is supplied to double-balanced mixer U7. The other input to this mixer is a CW picture carrier supplied from the video modulator module. The output from the mixer consists of the sum and difference of the two input signals and is taken from pins 3 and 13. This output is converted from balance to single-ended by balun T1. From here it is supplied to a 3-pole bandpass filter tuned to 41.25 MHz. The output of the bandpass

filter is supplied to voltage-controlled RF amplifier U8. The gain of the amplifier is controlled by a voltage on pin 5 which in turn, is set by the front-panel SOUND CARRIER LEVEL control R67. Thus, be adjusting R67 the amplitude of the sound IF output can be adjusted. From pin 6 of U8, the sound IF signal is supplied through a fixed-tuned bandpass filter consisting of L10, L11, and associated components and becomes the sound IF output on pin C, which is supplied to the vestigial sideband filter module.

When the subcarrier input is selected instead of the baseband audio input, the subcarrier is supplied on pin K, shown in the center left of the schematic diagram. This subcarrier is supplied from the video modulator module and is supplied to a 2-pole bandpass filter consisting of L3, L4, and associated components. When the audio module is programmed to accept a subcarrier input, switch diode CR10 is turned on and CR11 is turned off. This couples energy from the subcarrier input to limiter amplifier U6 and from here the operation is the same as described above for the baseband audio case. Selection of either the subcarrier or baseband audio is accomplished by a voltage on pin P. If pin P is left open, its voltage is pulled to 15V through R54. This puts a logic one on the input to pins 8 and 9 of U5, resulting in a logic zero or 0V on pin 10. This turns diode CR10 off and through the next section of U5 turns diode CR11 on. If pin P is grounded, the opposite state exists with CR10 turned on and CR11 turned off.

4.3.5 VESTIGIAL FILTER MODULE

Refer to figure 8-10, the vestigial filter module schematic diagram. The double sideband IF signal from the video modulator module is supplied on connector J2 on the vestigial filter module. This connector is shown in the upper left of the schematic diagram. The signal is first applied to a fixed pad, then to a pad selected during checkout to normalize the gain through the module to approximately -2 dB. From this pad, the signal is supplied to buffer amplifier Q1, a broadband stage with 75 ohms input and output impedances. This stage is used to increase the signal level before the signal is applied to the surface acoustic wave (SAW)

filter, which exhibits a substantial loss. From amplifier stage Q1, the signal is applied to autotransformer T2 which converts from a 75-ohm impedance level to the 50-ohm impedance level at which the filters are characterized. Pluggable jumpers on the input and output of the filter permit it to be bypassed and a 20-dB fixed pad inserted in its place, for test purposes. From the output of the filter, the signal is applied to a compensation network consisting of amplifiers Q2 and Q3 and the interstage network between them. Adjustments on this stage may be used to compensate for amplitude non-flatness in the SAW filter. The output from this compensation stage is taken through voltage divider C14 and C15 and is applied to a directional coupler. The sound IF from the audio modulator is supplied to the directional coupler so that flag Z contains the composite IF signal consisting of the vestigial sideband video signal plus the sound IF signal. The signal is next split in splitter T4 into two paths. The top path is applied through an attenuator, consisting of R22, R23, and R25, to isolation amplifier Q4. The output of Q4 is supplied through a lowpass filter and through an attenuator pad consisting of R47 through R49 and becomes the fixed-level auxiliary output on the rear of the modulator. The lower path from splitter T4 is supplied through a cascode amplifier consisting of Q5, Q6, and associated components. A PIN diode attenuator in this stage permits the gain of the stage to be controlled by the front-panel VIDEO CARRIER level control potentiometer R31. The output signal from the collector of Q6 is taken through a double-tuned bandpass filter and through a fixed attenuator to the IF output. This IF output is normally supplied to the output converter module.

4.3.6 OUTPUT CONVERTER LOCAL OSCILLATOR

The output converter local oscillator module supplies the oscillator signal required by the output converter double-balanced mixer to convert the IF signal to the desired output channel. The local oscillator module will function either as a crystal oscillator and buffer stage for off-channel operation, or a two-stage buffer amplifier for on-channel operation. The particular mode of operation is determined by the position of a two-

position switch located on the pw board. For on-channel operation, the amplified local oscillator signal is derived from a sample of the oscillator signal generated in the input converter.

4.3.6.1 Sub-Low Band Output Converter Local Oscillator

Refer to figure 8-12, the sub-low band output converter local oscillator schematic diagram. When switch S1 is in the off-channel position, the LO input connector is disconnected, and feedback is closed around amplifier Q1. It is then a grounded-base oscillator. Frequency control for this stage is provided by crystal Y1. The collector circuit consisting of L2, R5, and C6 is resonant at the crystal frequency. Sufficient feedback to sustain oscillation is provided to the crystal via capacitive divider network C4 and C5. The signal passes through a 3-dB T-pad attenuator to the input of buffer amplifier Q2. This amplifier is of a broadband configuration. The signal then passes through a low-pass filter consisting of C13, C14, C15, L4, and L5 and finally exits the module through a plug-in attenuator pad AT1.

When switch S1 is in the on-channel position, amplifier Q1 is converted to a common-emitter type. Under these conditions, the signal present at the EXT LO IN connector J1 passes through cable W1, coupling capacitor C1, and is then amplified by the two-stage buffer amplifier Q1 and Q2.

4.3.6.2 Low Band Output Converter Local Oscillator

Refer to figure 8-14, the low band output converter local oscillator schematic diagram. When switch S1 is in the off-channel position, diode CR2 is reverse-biased by the 6.2-volt Zener diode CR1 connected to its cathode through resistor R3. Also, C3, the emitter bypass capacitor, is nonfunctional. Under these conditions, Q1 functions as a grounded-base oscillator. Frequency control for this stage is provided by crystal Y1. The collector circuit, consisting of L2, C6, and C8, is resonant at the crystal frequency. Sufficient feedback to sustain oscillation is provided to the crystal via capacitive divider network C4

and C5. The signal out of this oscillator is coupled through capacitors C9 and C10 and the 3-dB pad R7, R8, and R9 to the base of buffer amplifier Q2. The collector of this common-emitter buffer amplifier drives a single-tuned circuit consisting of L4 and C13. The output signal passes through the impedance-matching capacitor C15; the low-pass filter made up of L7, L8, C17, C19, and C20; and plug-in attenuator pad AT1, where it then exits the module via the LO OUT connector J2.

When switch S1 is placed in the on-channel position, diode CR2 becomes forward-biased by having its anode connected to B+ through resistor R2. Also, one end of C3 is grounded, stopping Q1 from oscillating and converting it to a common-emitter amplifier. Under these conditions, the signal present at the EXT LO IN connector J1 passes through cable W1, coupling capacitor C2, and diode CR2, where it is then amplified by two-stage buffer amplifier Q1 and Q2.

4.3.6.3 Mid-Band, High-Band, and Super-Band Output Converter Local Oscillator

Refer to figure 8-16, the mid-band, high-band, and super-band output converter local oscillator schematic diagram. When switch S1 is in the off-channel position, diode CR2 is reverse-biased by the 6.2-volt Zener diode connected to its cathode through resistor R3 and inductor L1. Also, C8 and C9, the emitter bypass capacitors, are nonfunctional. Under these conditions, Q1 functions as an oscillator, with the frequency control provided by crystal Y1. The resonant circuit from the base to ground, consisting of L1, C3, and R2 is tuned to the crystal frequency. Sufficient feedback to sustain oscillation is obtained by feeding energy from the emitter through the crystal into the resonant circuit via voltage step-up capacitive divider C4 and C5. The collector circuit of Q3 is series-resonant to ground at the crystal frequency, but parallel-resonant to ground at the desired mixer LO frequency of two times the crystal frequency. The series-resonant circuit consists of L3, C10, R4, with C6 and C7 acting as a partial bypass at two times the crystal frequency. The desired oscillator signal is coupled through impedance-matching capacitor C11 to the base of common-emitter buffer amplifier Q2. The

collector of Q2 is similar in operation to that of Q1 with L6, C14, and C16 being series-resonant to ground at the crystal frequency and L6, C18, C14, and C16 being parallel-resonant at two times the crystal frequency. The oscillator output signal is coupled through impedance-matching capacitor C19, the resistive pad consisting of R12, R13, and R14, and the low-pass filter consisting of L8, L9, C22, C23, and C24 where it then exits the module via the LO OUTPUT connector J2.

When switch S1 is placed in the on-channel position, diode CR2 becomes forward-biased by having its anode connected to B+ through resistor R7. Also, one end of C8 and C9 is grounded, stopping Q1 from oscillating and converting it to a common-emitter amplifier. Under these conditions, the signal present at EXT LO INPUT connector J1 passes through cable W1, coupling capacitor C13, and diode CR2, where it is then amplified by two-stage buffer amplifier Q1 and Q2.

4.3.7 OUTPUT CONVERTER

The output converter accepts as an input a combined video and audio IF signal, either from the vestigial filter module or from an external source via the high level switching option. This signal is mixed with that from the local oscillator to produce the RF output signal. This RF signal is then amplified in a broadband hybrid amplifier and filtered in a bandpass filter before being connected to the RF output connector.

4.3.7.1 Sub-Low Band Output Converter

Refer to figure 8-18, the sub-low band output converter schematic diagram. The video and sound IF or standby carrier IF enter this module through IF IN connector J1. From here, it passes through plug-in attenuator pad AT1 and into the mixer consisting of T1, T2, T3, T4, and diode quad CR1. The local oscillator signal required by the mixer enters this module through LO IN connector J2. RF out of the mixer goes through a low-pass filter comprised of L1, L2, L3, C1, C2, C3, C4, and C5. It is then amplified in broadband amplifier Q1. The output comes through blocking capacitor C8 and then minimum-loss matching pad R6 and R7.

The RF signal continues through a high-pass and a low-pass filter consisting of L5, L6, L7, C10, C11, C12, L8, L9 and C13, C14, C15, L10, L11, respectively. Here it is connected to the input of broadband amplifier A1. The signal out of this amplifier passes through another low-pass filter and a resistive pi-pad attenuator where it enters cable W1 and exits the module through connector J3. Capacitor C17 of the final low-pass filter is variable to permit fine matching of the filter input to the hybrid amplifier output. The output signal is also applied across T6 which along with C19 and R11 provides a 20-dB down test signal made available on the front-panel test connector.

4.3.7.2 Low, Mid, High, and Super-Band Output Converter

Refer to figure 8-20, the low, mid, high, and super-band output converter schematic diagram. The video and sound IF enter this module through IF IN connector J1. From here, it passes through plug-in attenuator pad AT1 and into transformer T1, which is part of the double-balanced mixer consisting of transformers T1 and T2 and diode quad CR1 (A, B, C, and D). The local oscillator signal required by the mixer enters this module through LO IN connector J3, passes through cable W1, to a broadband amplifier consisting of Q1, and then is connected to mixer transformer T2. The RF signal out of the mixer transformer is coupled through impedance-matching capacitor C8 to the input of the triple-tuned circuit consisting of L9, L12, L15, C9, C15, C19, L10, and L13. The output of this circuit then passes through impedance-matching capacitor C21 to the input of broadband hybrid amplifier A1. The interstages of this amplifier are connected together via the resistive pad comprised of R6, R7, and R8. The signal out of this amplifier passes through impedance-matching capacitor C27, to the input of the four-section bandpass filter consisting of L18 through L21, and C28 through C36. The output of this filter is then coupled through impedance-matching capacitor C37 and cable W2 where it is connected to RF OUT connector J4. This same output signal is applied across T4 which provides a 20-dB down test signal which is coupled through R9 in parallel with C38 and made available on front-panel test connector J5.

4.3.7.3 Hyperband Output Converter

Refer to figure 8-23, the hyperband output converter schematic diagram. The video and sound IF enters the module through the IF IN connector J1. It then passes through plug-in attenuator pad AT1 and is applied to one port of a double-balanced mixer A4. The local oscillator signal required by the mixer enters the module through the LO IN connector J2. This signal is then applied directly to the mixer.

The RF signal out of the mixer is then applied to an L-pad attenuator consisting of R1 and R2. The signal is then coupled through C3 to the input of a triple tuned filter consisting of L6, L7, C3, C4, C5, C6, and C7. Capacitor C8 then couples the output of the filter to the input of hybrid amplifier A1. A1 is a broadband hybrid amplifier with a power gain of 14 dB.

The output of hybrid amplifier A1 is coupled through C9 to R4 which, when added to the output impedance of the hybrid, provides a 75-ohm source for the triple-tuned filter consisting of C10, C11, C12, C13, C14, L8, and L9. The output of this filter is coupled through C15 to hybrid amplifier A2 which provides an additional 14 dB of gain.

Capacitor C16 couples the 50-ohm output of hybrid A2 to R7. The signal then passes through R7 to the 75-ohm input of the broadband hybrid power amplifier A3. A3 provides an additional 17 dB of gain.

The output of A3 is then applied to the final triple tuned filter consisting of C19, C20, C21, C22, C23, L10, and L11. The output of the filter is then connected to the RF OUT connector J3. This same signal is then applied through R8 and R9 to 20-dB down test point J4.

4.3.7.4 Extended Hyperband Output Converter

Refer to figure 4-26, the extended hyperband output converter schematic diagram. The video and sound IF enters the module through the IF IN connector J4. It passes through plug-in attenuator pad AT1 and is applied to a double-balanced mixer U1. The local oscillator signal enters the module through the LO IN connector J5. The LO signal is amplified approximately 3 dB by Q1 and is applied to mixer U1.

The mixer output consists of the desired RF signal plus undesired signals such as the LO, IF, and other mixer products. The mixer output is attenuated 5 dB by R9 and R10 and is applied to the first bandpass filter. The two-resonator bandpass filter consists of L4, L5, C9, C10, C11, C12, L6, and L7. The signal is amplified 14 dB by hybrid amplifier U2.

The output of amplifier U2 is attenuated 2 dB by R18 and R19 and is applied to the second bandpass filter. The two-resonator filter consists of L8, L20, C16, C17, L9, C19, L10, and L11. The signal is attenuated 2 dB by R14, R15, and R16 and is amplified 14 dB by hybrid amplifier U3. The resistive attenuators provide isolation between stages.

The output of U3 is impedance matched to hybrid amplifier U4 by C23, L13, and C24. Amplifier U4 has a gain of 17 dB.

The output of U4 is applied to the final two-resonator filter consisting of L16, L17, C27, C28, C30, L18, and L19. The output of the filter is connected to the RF OUT connector J6. The output signal also is applied to a capacitor divider consisting of C31 and C32. The output of the divider is applied through R20 to the 20-dB test point J7.

4.3.8 VIDEO SWITCH MODULE

Refer to figure 8-29, the video switch schematic diagram. The main video input is supplied on connector J1, shown in the top left of the schematic diagram. A termination resistor for the video is not shown on the schematic diagram because it exists as a switchable termination on the rear panel of the modulator. The video signal is applied to a video isolation amplifier consisting of Q1 through Q3 and associated components, and through a low-pass filter to a video switch consisting of transistors Q5 and Q6 and associated components. The video switch is ON when the gates of the two FET switching transistors are at +10V and is OFF when the voltage on the gates drops to 0V. From the output of the switch, the video is applied to the base of the buffer transistor Q10.

The alternate video is supplied on connector J3, shown at the lower left corner of the schematic diagram. The signal path for the alternate video is identical to that for the main video except that the termination resistor for the alternate video is included in the module. The alternate video and the main video are brought together at the base of buffer transistor Q10. The signal is applied next to emitter follower Q11, and from Q11 to a compound class A output stage consisting of Q12 and Q13. The video out from the module on connector J2 is then supplied to the video modulator module.

The remaining circuitry in this module is associated with activating the video switches. A sample of the main video signal is removed from the emitter of Q3 through resistor R9 and is buffered by emitter follower Q4. The signal is then applied to an active bandpass filter consisting of operational amplifier U1A and associated components. The filtered signal on pin 7 of U1A is applied to a rectifier consisisting of diodes CR2 through CR4 and associated components. A dc level proportional to the video amplitude is stored on capacitor C11. Operational amplifier U1B is a comparator with a threshold voltage set on pin 2 by resistors R26 and R27. If the main video is present, a voltage exists on C11 which exceeds that on pin 2 of U1B. In this case, the output on U1B, pin 1, is positive and transistor Q8 is held off. The collector of Q8 is then at a potential of 0V and driver transistor Q7, which drives the main video switch, is also turned off. This permits 10V to exist on the gate of transistors Q5 and Q6, holding the main video switch on. At the same time, transistor Q9 is turned off and its collector is pulled up to approximately +20V. This turns on transistor Q19, the driver transistor for the alternate video, resulting in the alternate video switch Q17 and Q18 being turned off.

Should the main video be lost, capacitor C11 will discharge toward approximately 10V. When the voltage across C11 drops below the voltage on pin 2 of U1B, the output of U1B goes low. This permits capacitors C12 and C13 to discharge through resistor R29 within a discharge time constant on the order of 10 seconds. This provides a delay in switching so that the switch will not activate immediately upon loss of main video. Note that by removing the jumper in series with capacitor C13, the delay time may be reduced. When the voltage across capacitors C12 and C13 drops below approximately 10V, transistor Q8 is turned on so that its collector goes to +20V. This turns on transistor Q7, which in turn pulls the gate voltage on transistors Q5 and Q6 to 0V, turning off the main video switch. At the same time, transistor Q9 is turned on, resulting in the alternate video switch being turned on and alternate video being applied now to the base of Q10. In addition, when Q9 turns on, the LED indicator is illuminated, indicating the main video has been lost. A SIGNAL OFF output line, pin P of the printed-wiring board connector, is used to drive either a solid state IF switch, the audio switch, or the audio module as required to permit switching another IF source or to permit switching the audio baseband accordingly. Normally, pin P of the connector is connected to the collector of Q9. This results in a logic signal that is at approximately +20V when the main video is present, and is pulled to 0V when the alternate video is selected. This is the correct logic sense to operate the IF SWITCH minus port and also to activate the audio switch to switch from the main audio to the alternate audio input. However, in the case that the main video signal is accompanied by a subcarrier audio signal and the alternate video is accompanied by baseband audio signal, the sense of the switching signal on pin P is incorrect to set the mode of the audio module. When this situation exists, the jumper wire connecting pin P into the printed-wiring board is moved from the collector of Q9 to the collector of Q8 as shown by the dashed line in the schematic diagram. When this is done, the sense of the signal on pin P is a voltage of 0V for the main video input and voltage close to +20V for the alternate video input. Moving this wire is described in paragraph 3.7.1.

4.3.9 VIDEO AGC MODULE

The video AGC module removes undesirable amplitude variations in an incoming baseband video signal before application to the video modulator.

Refer first to the simplified block diagram shown in figure 4-2. The incoming video signal is applied through connector J1 to a video buffer amplifier consisting of transistors Q1 through Q4. From here the signal is applied to a variable gain element consisting of resistor R19 and the light dependent resistor LDR1. The resistance of the LDR is a function of the current through the light emitting diode (LED) associated with it. As current through the LED increases, the resistance of the light dependent resistor decreases, resulting in a decrease in video level. A feedback control circuit described below controls the current to the LED. From the output of the variable gain block, the signal has added to it a dc offset component required to normalize the dc level such that the blanking level is at a fixed reference voltage. This is necessary to permit the amplitude of the sync tips to be measured with respect to this reference voltage. Only the sync tip amplitude is used in determining the required gain of the circuit, so the circuit gain does not fluctuate as picture content changes. After the dc offset is added, the signal is applied through an output amplifier consisting of transistors Q6 and Q7. The output from the module is then supplied to the video modulator module.

Two feedback loops exist from the output of the video AGC back to circuitry in this module. One feedback loop consists of a sample and hold detector formed by Q18 and U3 and compensation amplifier U2. A sample command is generated during the back-porch interval, which samples the dc level on the output during this time. A correction voltage is fed back through the dc offset loop to ensure that the voltage level during the back-porch interval stays constant. The other feedback loop is the variable gain loop. It includes a peak detector which detects the peak amplitude of the sync. This detector consists of integrated circuit

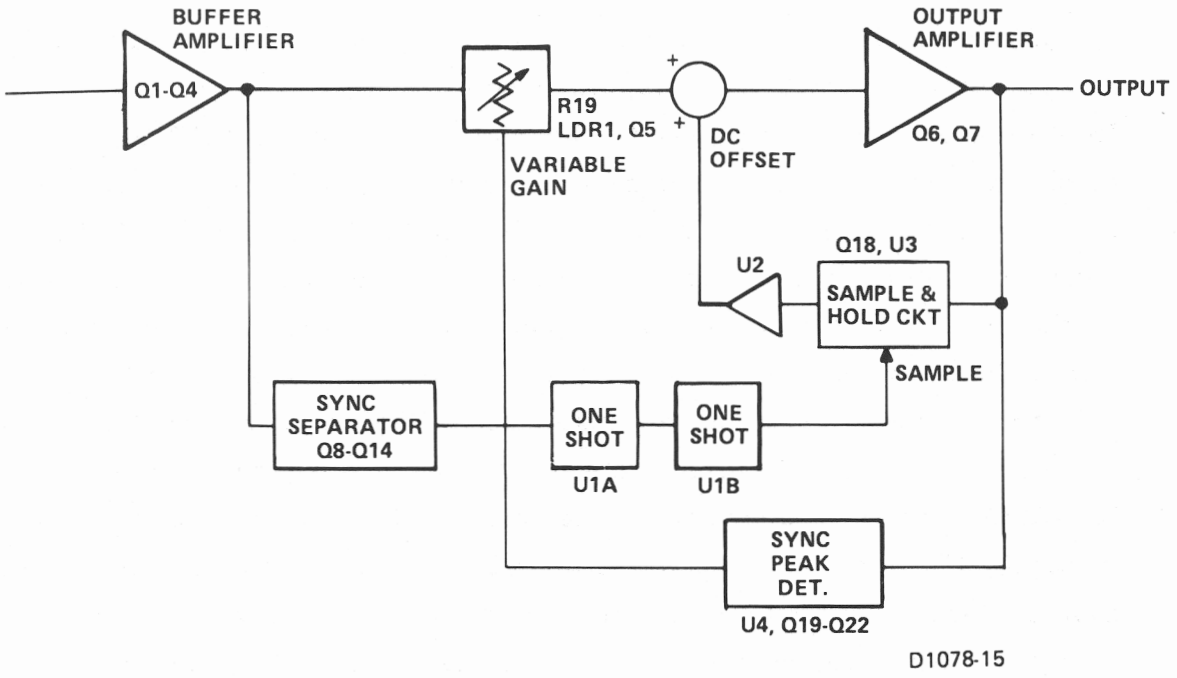


Figure 4-2. Video AGC Simplified Block Diagram

U4 and transistors Q19 through Q22. The output is a voltage proportional to the difference in amplitude between the sync tip level and to the reference level established in the dc offset loop. The output of the sync peak detector is applied back to the variable gain element. The feedback loop acts to hold the amplitude of the sync pulses to a reference value established in the sync peak detector.

A sync separator consisting of transistors Q8 and Q14 is driven from the input buffer amplifier. It is required to permit operation of the sample and hold circuit described above. The output of the sync separator triggers two one-shots, the second of which establishes a sample window during the back-porch interval, which activates the sample and hold circuit Q18 and U3.

Refer now to figure 8-31, the schematic diagram of the video AGC module. Video input on J1, in the upper left corner of the diagram, is supplied through an input buffer amplifier consisting of Q1 through Q3 and an emitter follower Q4. At this point, the sync signal is taken off through resistor R29 to the sync separator which is described below. The video signal is also supplied through resistor R19 to the LDR which acts as the variable gain element in the module. Transistor Q5 is a buffer amplifier following the gain control point. The signal is next applied to the output amplifier Q6 and Q7 along with a dc offset voltage supplied through resistor R63. The output from the emitter of Q6 is supplied through R27 and C10 to the video output and from here to the video modulator module.

In addition, the video output from the emitter of Q7 is applied to the sample and hold circuit consisting of Q18 and integrated circuit U3. Transistor Q18 acts as an analog switch, opening when the voltage on its gate is allowed to rise to 10V and closing when the voltage is pulled down to 0V. This switch is driven by transistor Q17, which in turn is driven from the sync separator and one-shot delay circuit described below. Sampling transistor Q18 is closed during the back-porch interval, coupling the output dc level during the back-porch interval to holding capacitor C26. Integrated circuit U3 is a high-impedance buffer amplifier used to avoid loading on C26. Integrated circuit U2 is an operational amplifier configured as an integrator, the output of which is supplied

back to the input of the final amplifier stage Q6. It adds an offset voltage which forces the output dc level to the value required to make the dc level during the back-porch interval equal to a reference level. This reference level is established by Zener diode CR10, shown below isolation amplifier U3 in the schematic. This completes the dc offset loop described above.

In addition, the output from the emitter of Q6 is applied to the sync peak detector consisting of comparator amplifier U4 and transistors Q19 and Q20. The operation of this circuit is such that a voltage is stored on capacitor C28 proportional to the error in the amplitude of the sync tip level. When in the AGC mode, this voltage is transferred through emitter followers Q21 and Q22 to the light emitting diode which is part of the light dependent resistor assembly LDR1. In the manual gain control mode a front-panel manual gain potentiometer, R80, substitutes for the voltage stored across C28.

The sync separator is shown in the lower left portion of the schematic diagram. Video is applied from the emitter of transistor Q4 through a lowpass filter consisting of R29 and C11 to emitter follower Q8. The video signal is coupled from here to the gate of field effect transistor Q9. Transistors Q9 and Q10 form a feedback network such that with no input signal, the voltage on the gate of Q9 is that required to hold the voltage on the source of Q9 approximately two diode drops below the reference level established by diode CR6. When the signal goes positive, that is, going away from the sync tip level and toward the active video levels, then transistor Q10 turns off, causing the voltage on the collector of Q10 to drop toward ground. During the sync tip time, transistor Q10 enters its active region, sourcing whatever current is required to cause the source of Q9 to take a voltage two diode drops below the reference level. Thus, the waveform on the collector of Q10 is a square wave coincident with the sync signal. The square wave is positive going during the sync interval. This waveform is buffered by emitter follower Q11 and applied to Q12. The resistor and capacitor in the emitter of Q12 average the value of this waveform over the entire cycle of both sync and active video such that the signal on the collector of Q12 is a negative-going pulse during the sync period. This is converted to a 20-volt positive-going sync pulse by Q13. This sync pulse is applied through voltage divider R46 and R47 to the

trigger input of one-shot U1A. The input used activates the one-shot during the trailing edge of the sync pulse. This one-shot, in turn, fires a second one-shot U1B which generates a strobe or sample command during the back-porch interval. This command is coupled through resistor R60 and resistor R61 to the base of transistor Q17. Note that for normal operation, transistor Q16 is turned off. Transistor Q17 inverts the sample command signal and applies it to the gate of the sampling transistor Q18 described above. Should the video level decrease to the point that reliable firing of one-shot U1A is not possible, then the network at the bottom of the schematic diagram, R55 through R59 and Q16, acts to turn Q16 on, defeating the sample and hold loop and holding it continuously in the sample mode.

4.3.10 VIDEO SWITCH AND AGC

Refer to figure 8-33, the schematic diagram of the video switch and AGC option. The video switch and AGC option is a combination of the video switch option and the video AGC option. Refer to the Theory of Operation of those sections for the operation of the combined switch and AGC option.

4.3.11 AUDIO SWITCH MODULE

The audio switch is used when it is desired to switch between different baseband audio inputs. Two audio inputs are provided with this option in addition to the one audio input provided with the basic modulator. One of these audio inputs, referred to as the alternate audio input, is normally used in conjunction with the video switch to permit audio follow video action when both the main and alternate videos have baseband audio program material associated with them. The second input to the audio switch module is an override audio input used with emergency audio override. It is selected by a contact closure on the rear panel of the modulator and overrides any other baseband audio input.

Refer to figure 8-35, the schematic diagram for the audio switch option. Alternate audio is supplied on pins H and J of the printed-wiring board connector and is applied through a balance-to-single ended circuit

consisting of one-half of integrated circuit U1. The output of this circuit, on pin 1 of U1, is applied to the deviation adjustment potentiometer R6. The signal is then coupled through a pre-emphasis network consisting of R8 and C5 and through switch integrated circuit U3 to pin C of the audio switch pw board. Pin C is connected to pin N of the audio modulator and is the summing junction of an operational amplifier on the audio modulator printed-wiring board.

The override audio is applied similarly on pins E and F of the audio switch option to a balance-to-single ended amplifier U1B. Smaller coupling capacitors are used on this input to reduce the low frequency response of the audio override input, restricting it to those frequencies necessary for intelligible voice communication. The output from U1B is applied to the deviation control potentiometer R18 and through summing resistor R20. The pre-emphasis capacitor is omitted from the override audio input in order to provide for roll-off of high frequency components that may be present on the input, which may contribute distracting noise but do not contribute to the intelligibility of the signal being handled. From resistor R20, the signal is applied through a second section of switch U3 again to the summing junction of the operational amplifier in the audio modulator.

The other circuitry on the audio switch option is associated with control of switch U3 and the switch in the main audio path in the audio modulator. When alternate audio is selected, pin L on the audio switch connector is grounded. Pin L is in the lower left corner of the schematic diagram. Normally, jumpers A and C are installed and jumper B is omitted. This places inverter U2C in the circuit. Thus, normally when pin L is not grounded a logic "1" exists on the input of U1C and the logic "0" exists on the output. When pin L is grounded, a logic "1" appears on U2 pin 10. This is supplied to the next section of the gate U2A. When this signal goes to a logic "1", the output on pin 3 goes to logic "0". This is inverted by U2D to again be a logic "0" on the output, which commands the switch integrated circuit U3 to be enabled. In addition, the logic "0" on U2, pin 3, is coupled through diodes CR4 and CR5 and resistor R21 to the auxiliary audio select output on pin B. This line is connected to pin M of the audio modulator module and causes switch transistor Q1 in the audio modulator to turn off, interrupting the audio from the main audio input.

When the override audio is selected, pin K is grounded. Normally, when pin K is not grounded, its input is pulled to approximately +10V. This level is coupled to U3, pin 2, through level-shifter Zener CR2 and represents the command to open the switch section used for override audio. However, when the input on pin K is grounded, the switch command seen on U3, pin 2, requires that the switch controlling the alternate audio input be open and the override switch section closed. In addition, the logic "0" on pin K is inverted in integrated circuit U2B and is applied to pin 2 of U2 where it again causes a logic "0" on U2, pin 3, enabling switch U3, and again turning off the main audio path in the audio modulator module as described above.

4.3.12 AUDIO MODULATION LIMITER

The audio modulation limiter is inserted in the audio modulator module as shown in the schematic for the audio modulator (figure 8-8), in the center top of the schematic. The modulation limiter effectively places in the feedback around operational amplifier U1C a variable resistor whose value depends upon the peak-to-peak amplitude of the output signal on pin 10 of U1 in the audio modulator. Refer now to figure 8-37, the schematic diagram of the audio modulation limiter. Input on pin 5 of the limiter is from the output of operational amplifier U1C on the audio modulator. This signal is applied to two places. It is applied through resistors R2 and R3 to operational transconductance amplifier U1 (modulation limiter). Amplifier U1 acts as a variable resistor in the feedback for the operational amplifier on the audio modulator printed-wiring board. The value of the effective resistance of U1 is determined by current coming into pin 5 of U1. This current is determined by the feedback loop shown below U1. The audio input on pin 5 of the modulation limiter is also applied to a precision full-wave rectifier consisting of U2D and U2C. The signal on pin 10 of U2 is negative-going from the 10V reference and is proportional to the peak amplitude of the audio signals. Since a full-wave rectifier is involved, the voltage on pin 10 will be proportional to either the negative or positive peaks, whichever is greater. The peak voltage on pin 10 is stored in capacitor C2 and buffered by U2B. The output on U2, pin 4, is a voltage proportional to the excess peak-to-peak amplitude of the incoming signal

on pin 5 of the modulation limiter. This voltage is applied to the base of current-source transistor Q1 whose output current is used to control the transconductance of operational transconductance amplifier U1, thus adjusting the effective resistance in the feedback around the operational amplifier on the audio modulator printed-wiring board.

4.3.13 DC CONVERTER

Refer to figure 8-38, the schematic diagram of the dc converter. This optional module may be substituted for the power supply module. The dc converter receives -19V to -32V dc from a connector through a 3-ampere fuse located on the rear panel of the chassis and enters the module by pin P on the printed-wiring board. A positive input is shorted to ground through diode CR5 to protect the module's electronics.

A -15-volt regulator, U3, supplies power to the control circuitry.

U2 is a switchmode-regulator control circuit whose outputs are alternating pulse trains. These outputs switch transistors Q1 and Q2 which, as a result, switch the two power Darlington transistors Q3 and Q4. Hence, the grounded center-tap primary of T1 is alternately switched with the input dc. This is stepped up in voltage, full-wave rectified, and filtered, to yield a positive dc voltage.

Voltage regulation is accomplished by sampling the output voltage and comparing that to a resistive divider reference, using the output of U3 as a voltage standard. The difference signal becomes a control voltage for U2. The initial voltage setting is done at the factory by adjusting potentiometer R12.

Current limiting for this module is based on output current. The voltage across R27 is fed back and compared to a resistive divider reference. The difference signal is diode ORed to the control voltage of U2. Current limit is set at the factory by adjusting potentiometer R3.

The control voltage has one final contributor, a soft start network consisting of C1 and CR3. This feature forces U2 to gradually increase

the width of its pulses during turn-on to prevent saturation of the transformer core. Therefore, a very short delay occurs between the initial switch turn-on, and the +20-volt output, as indicated by the front-panel lamp delay.

The resulting control voltage determines the pulse width of the output of U2. The frequency is set to approximately 25 kHz. The duty cycle will range from 47% to 0%, depending on the input voltage and load conditions.

4.3.14 AUXILIARY IF AGC

Refer to figure 8-40, the schematic diagram of the auxiliary IF AGC. Input is supplied to the base of Q1. Transistors Q1 and Q2 form a cascode amplifier with PIN diodes CR1 and CR2 at the junction of the two transistors. As the current in the diodes increases, the RF resistance decreases. This shunts RF current away from Q2, and to ground. Thus, the gain of the cascode is reduced. Output from Q2 is taken through a matching network.

A sample of the RF signal is taken through R11 and R12, to RF amplifier U1. Output from U1 is supplied to video detector U2. Output from U2 is on pin 4, and has the characteristic that the sync tip amplitude decreases as the input signal increases. This detected video is supplied to the input of U3, which functions as a peak detector. As the signal level into U2 increases, the output of pin 5 of U3 rises. This signal is buffered by Q3 and supplied to the PIN diodes as the control signal.

4.3.15 SOLID STATE SWITCH

Refer to figure 8-42, the schematic diagram of the solid state switch. The solid state switch is enclosed in its own housing, and was designed to be mounted in the rear section of the modulator. It is electrically equivalent to a single-pole double-throw relay with the added feature that an unused input is terminated in 75 ohms. The switch can be activated either by an external contact closure or by a voltage which changes from 0 volts to +5 volts to +20 volts. This switch was designed to be utilized

in the IF switching option offered on the Model 6350 Television Modulator.

Transistors Q1, Q2, Q3, and Q4 comprise the switch driver and are connected in such a manner that when Q4 is on, Q1 is off, Q3 is on, and Q2 is off. This condition causes the collector of Q3 to be at approximately +15 volts and the collector of Q2 to be at 0 volts. The collectors of Q2 and Q3 are connected to the switching diodes through the series arrangement of L1, R1 and L7, R11, respectively, such that with the conditions described above, series-arm diodes CR4 and CR7 of the normally closed input are forward-biased as are the shunt-arm diodes CR2 and CR6 of the normally open input. At the same time, shunt-arm diodes CR1 and CR5 and series-arm diodes CR3 and CR8 are off. An external contact closure grounding one end of R14 or a positive voltage applied through feedthrough capacitor C20 will change the switch driver such that now the collector of Q2 is at +15 volts and the collector of Q3 is at 0 volts. This condition will turn on diodes CR1, CR5, CR8, and CR3 and turn off diodes CR4, CR7, CR6, and CR2. This opens the normally closed input and closes the normally open input.

4.3.16 PHASE LOCK SERVO AND PHASE LOCK LOCAL OSCILLATOR

4.3.16.1 Low Band through Super Band Phase Lock Servo and Phase Lock Local Oscillator.

The theory of operation of the modulator phase lock servo and local oscillator for the low band through the super band will be presented with the aid of a functional block diagram keyed to the schematics shown in figures 8-44, 8-46, 8-48, and 8-50. This section should be understood thoroughly before any troubleshooting or adjustments are attempted.

Figure 4-3 is a block diagram of the phase lock circuitry (low band through super band) in the modulator. The reference designations accompanying each block indicate the corresponding components on the schematic diagrams.

A sample of the interfering signal is picked up and amplified in the local oscillator module. It is downconverted to IF using the VCXO as a local oscillator. After bandpass filtering, the signal is further amplified and then supplied to a limiter/detector circuit. This circuit has two outputs:

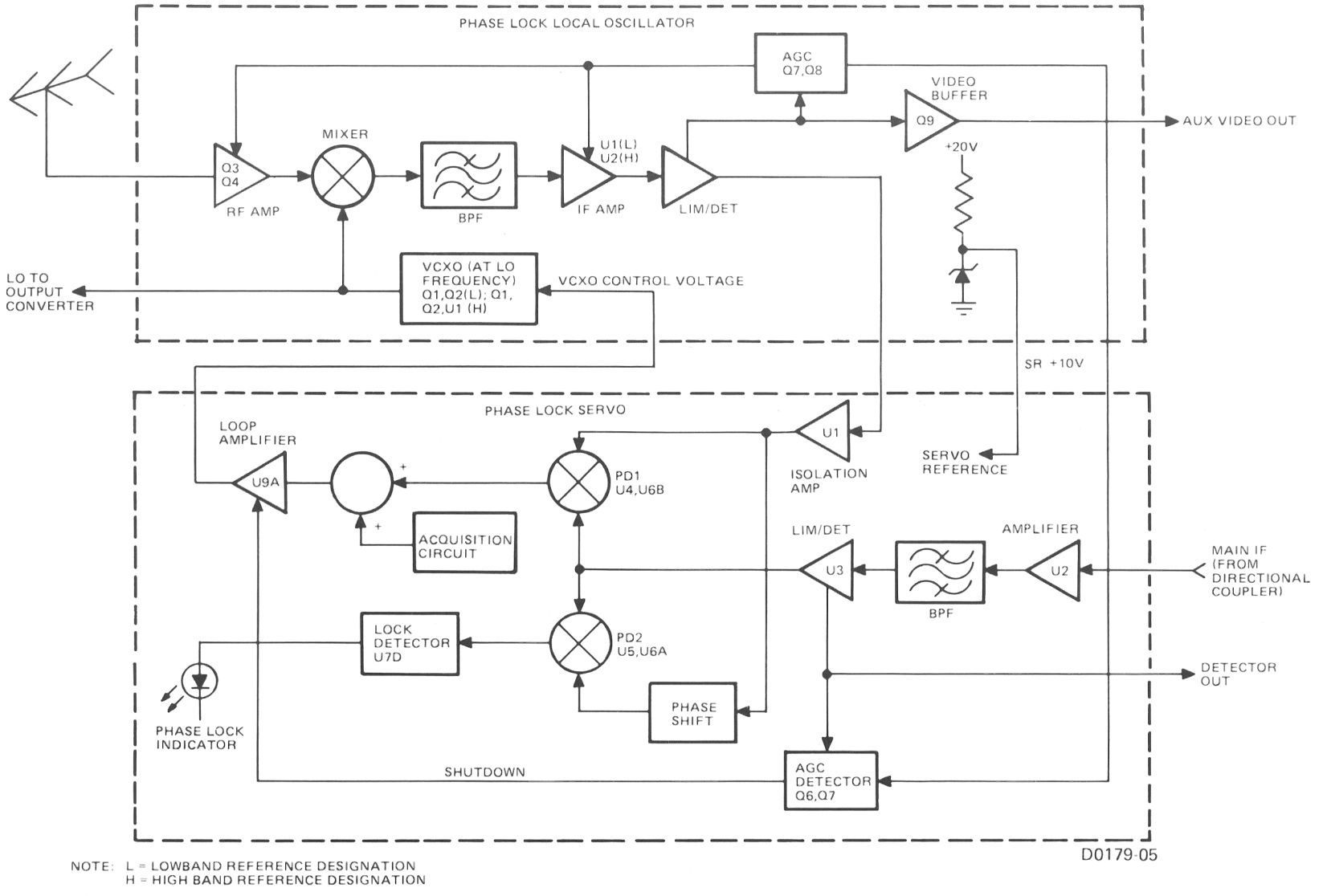
a video output demodulated from the reference, and an IF output which has been amplitude limited to reduce the sideband levels. Automatic gain control voltage is developed from the video output and is applied to the IF and RF amplifiers. In addition, AGC voltage is supplied to the servo module. Here, a threshold detector determines the presence or absence of a reference signal. If the reference is absent, the output of the loop amplifier (U9A) is forced to +10 volts dc (SR), causing the VCXO to run at the nominal LO frequency.

The IF output of the limiter is supplied to isolation amplifier U1 in the servo. From here, it is supplied to two phase detectors, PD1 and PD2 (a 90-degree phase shift is included in the circuit to PD2). The other input to the phase detectors is a sample of the main IF signal in the modulator, obtained from a directional coupler inserted just before the output converter. The main IF signal is amplified by U2 and limited by U3 before being applied to the two phase detectors. Phase detector PD1 is the main phase detector used in the closed loop, its output being supplied to loop amplifier U9A. This loop amplifier provides servo compensation. Its output is the VCXO control voltage, whose magnitude is proportional to the frequency range over which the VCXO must be pulled.

Phase detector PD2 is the quadrature phase detector used to detect the condition that phase lock has been achieved. Before lock is achieved, the acquisition circuit shown is active, forcing the VCXO frequency to move in such a manner as to approach the lock-in range.

The line labeled SR is a servo reference voltage (+10 volts) used as a reference for the VCXO control. When either the main IF or the reference signals are lost, the AGC detector forces the output of the loop amplifier to SR, establishing the nominal operating frequency of the VCXO.

From the above discussion, it can be seen that the phase lock loop forces the VCXO to run at such a frequency that, when the main IF signal is subtracted from the VCXO signal (in the output converter mixer), the difference frequency (desired output) will be phase coherent with the reference signal. (Remember that the frequency under discussion is the video carrier frequency.)



NOTE: L = LOWBAND REFERENCE DESIGNATION
H = HIGH BAND REFERENCE DESIGNATION

Figure 4-3. Phase Lock Block Diagram for Low Band Through Super Band

4.3.16.2 Hyperband Phase Lock Servo and Phase Lock Local Oscillator

The hyperband phase lock local oscillator module (HPLO) works in concert with the phase lock servo to form a two-lock frequency synthesizer. Referring to figure 4-4, the hyperband phase lock LO block diagram, note that the blocks above the dashed line form the primary phase lock loop, while those below it close the secondary loop. The primary loop, which can operate independently of the secondary loop, is a programmable frequency synthesizer with a smallest frequency step of 0.25 MHz. Its operation will be discussed first, leading to the overall view of the HPLO in operation with the phase lock servo unit. The reader should refer to figures 8-52 and 8-54, the schematic diagrams of the hyperband phase lock local oscillator and the hyperband P/L VCO, for a detail view of the circuitry described in the following paragraphs.

PRIMARY LOOP

The operating frequency of the primary loop is determined as follows: The VCO, operating in the 250 to 500 MHz range, is fed to a resistive splitter. The splitter drives the second mixer and a buffer amplifier to the output, but also provides a drive signal to a digital prescaler that divides the operating frequency by 4. The prescaler is followed by a 12-bit program divider (÷ N). The net division ratio achieved by the combination of these dividers is 4N. The output of the ÷ N divider is then fed to a digital phase/frequency detector, the other port of which is fed with a 62.5 kHz reference frequency. This reference frequency is obtained by dividing the output of a 6-MHz voltage-controlled crystal oscillator (VCXO) by 96.

The output of the phase/frequency detector is a voltage proportional to the phase/frequency error between the reference frequency (62.5 kHz) and the VCO frequency divided by 4N. This error signal is applied first to an active loop filter which amplifies the error voltage and provides for loop stability. The amplified error signal is fed through a passive low-pass filter which passes the error signal but blocks the passage of the residual 62.5 kHz reference frequency. The clean error signal is then fed to the frequency control input of the VCO, thus closing the primary loop. The VCO is forced to run at a frequency which, when divided by 4N, is equal to 62.5 kHz.

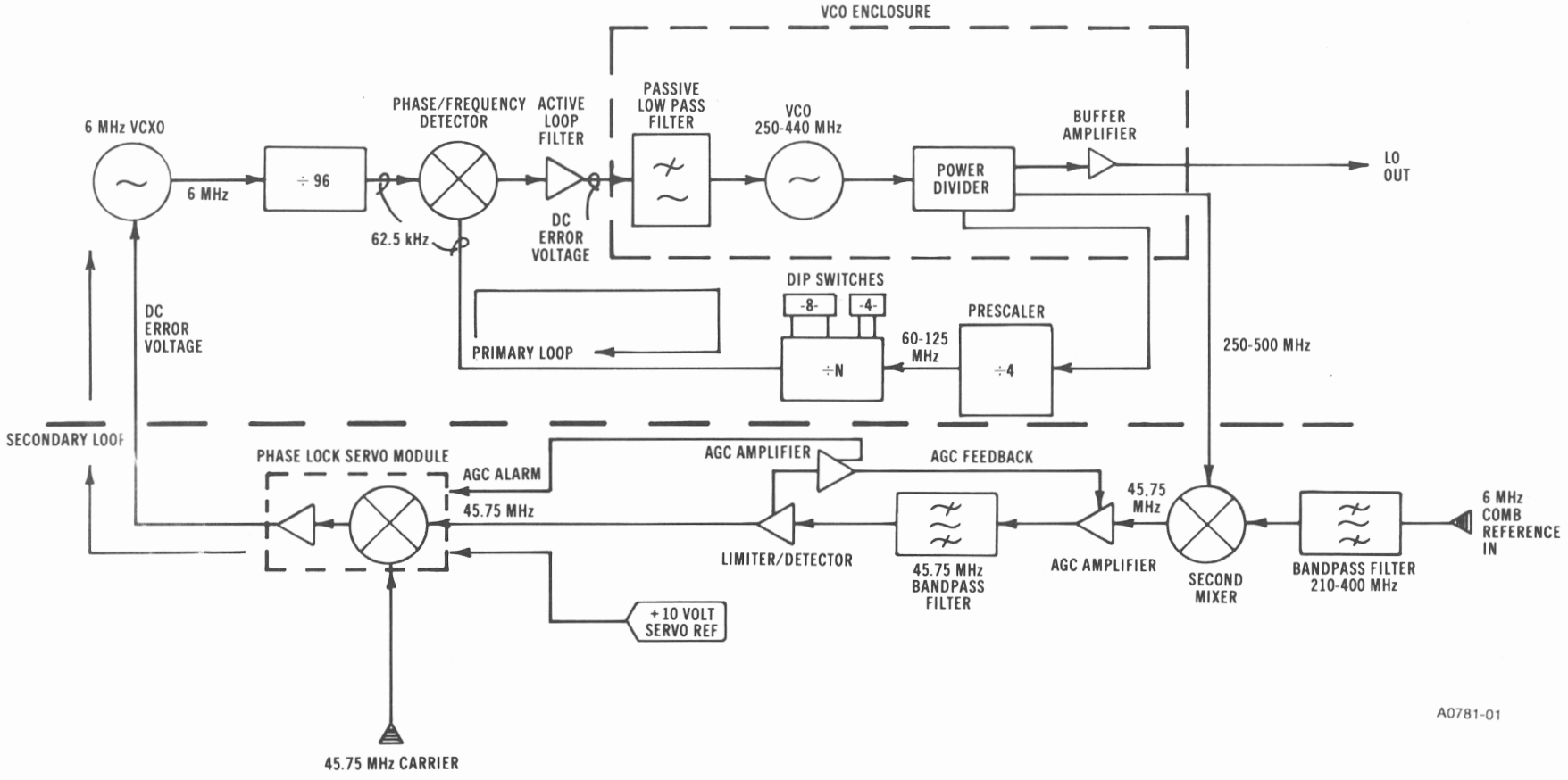


Figure 4-4. Phase Lock Block Diagram
for the Hyperband and Extended Hyperband

Note that an increase in N by 1 will increase the division ratio to 4 (N+1) due to the divide-by-4 prescaler. This is why a 62.5 kHz reference produces a 250 kHz (4X) smallest step. Consider the following example of a hyperband phase lock LO set for harmonic-spacing channel QQ:

For Channel QQ, $f_{LO} = 441.75$ MHz

Therefore $4N = \frac{441.75 \times 10^6}{62.5 \times 10^3} = 7068$

And $N = \frac{7068}{4} = 1767$

Changing N to 1768 gives

N = 1768; 4N = 7072

And $f_{LO} = 7072 \times (62.5 \times 10^3)$

Therefore $f_{LO} = 442 \times 10^6$ Hz

Or an increase in frequency of 0.25 MHz, four times the 62.5 kHz reference.

SECONDARY LOOP

In the secondary loop, the LO output in the 250 to 480 MHz range is applied to the second mixer whose other port is fed by an external 6-MHz comb reference (the comb reference is first bandpass filtered to select the desired harmonic of 45.75 MHz below the LO frequency). The output of the second mixer is fed to the 45.75 MHz first IF amplifier and a bandpass filter which passes the difference frequency while rejecting the sum frequency and other undesired mix products. This is followed by a limiter/detector which limits the 45.75 MHz output signal and provides a detected output signal to an AGC amplifier. The AGC amplifier feeds a gain control voltage back to the first IF amplifier to aid in maintaining a constant level at the output of the limiter/detector. The AGC amplifier also provides an alarm signal output in the event that the comb reference disappears or the LO falls out of phase lock.

The limited 45.75 MHz IF output from the limiter/detector is fed to the phase lock servo module. This module is also fed with an external 45.75 MHz reference frequency.

PHASE LOCK SERVO

In the phase lock servo, the two previously mentioned 45.75 MHz IF signals are fed to a phase/frequency detector. Its output is an error signal proportional to the phase/frequency difference between the two IF signals. This error signal is applied to a loop amplifier and filter which amplifies the error signal and provides for closed loop stability. The amplified error signal is then fed back to the VCXO in the LO module. A shift in the VCXO frequency, through the phase lock action of the primary loop, produces a change in the VCO (LO) frequency, multiplied by 4N (for example, a 100 Hz change in VCXO frequency produces a 4 kHz change in LO frequency at the low end of the band (near 250 MHz) or an 8 kHz change if operating at the upper end (near 500 MHz). A change in LO frequency translates directly to a change in the 45.75 MHz IF frequency at the output of the second mixer, thus closing the secondary loop.

The net result of all of this is the generation of an LO output frequency that is phase coherent with both a 6-MHz comb reference and a 45.75 MHz reference. Should the 45.75 MHz reference be lost, the phase lock servo automatically feeds to the VCXO in the hyperband phase lock LO a servo reference voltage which causes the VCXO (and thus the LO) to run at nominal center frequency. If the comb reference is lost, producing an AGC alarm voltage from the LO module to the phase lock servo module, the same happens. If the LO module is operated without a phase lock servo module in place, the LO provides its own VCXO voltage to force the LO to run at nominal center frequency unassisted.

4.3.17 SPECTRUM INVERTER

The theory of operation of the spectrum inverter will be presented with the aid of the functional block diagram (figure 4-5) and the schematic diagram (figure 8-57). Figures 4-5 and 8-57 should be studied while reading the following paragraphs.

The standard IF frequencies of 41.25 MHz (audio) and 45.75 MHz (video) are applied to the input connector J1. The signal passes through a resistive attenuator R1, R2, and R3, and then into one port of a double-balanced mixer consisting of T1, T2, and CR1. The other input to the mixer is from the 115-MHz local oscillator.

The 115-MHz local oscillator consists of oscillator transistor Q1 and associated components. The oscillator is a common base configuration with feedback provided through crystal Y1 from a tap on the collector. A tuned circuit consisting of inductor L4 and capacitors C9, C10, and C11 tune the collector of the transistor to ensure that the oscillator operates on the correct crystal overtone. Energy is coupled from the oscillator through capacitor C6 to the second input of the double-balanced mixer. By repositioning plug P1 between connectors J4 and J3, the oscillator signal will appear at TP1 where it can be observed on a spectrum analyzer or frequency counter.

At the output of the double-balanced mixer, the sum frequencies of 156.25 MHz (audio) and 160.75 MHz (video) are selected by a 3-section bandpass filter consisting of inductors L3, L7, L9, and associated components. The signals are then amplified by transistors Q2 and Q3 which form a "Totem-pole" amplifier. The "Totem-pole" circuit configuration has the low distortion characteristics normally found in push-pull amplifiers, but with an unbalanced output capable of driving a low impedance load.

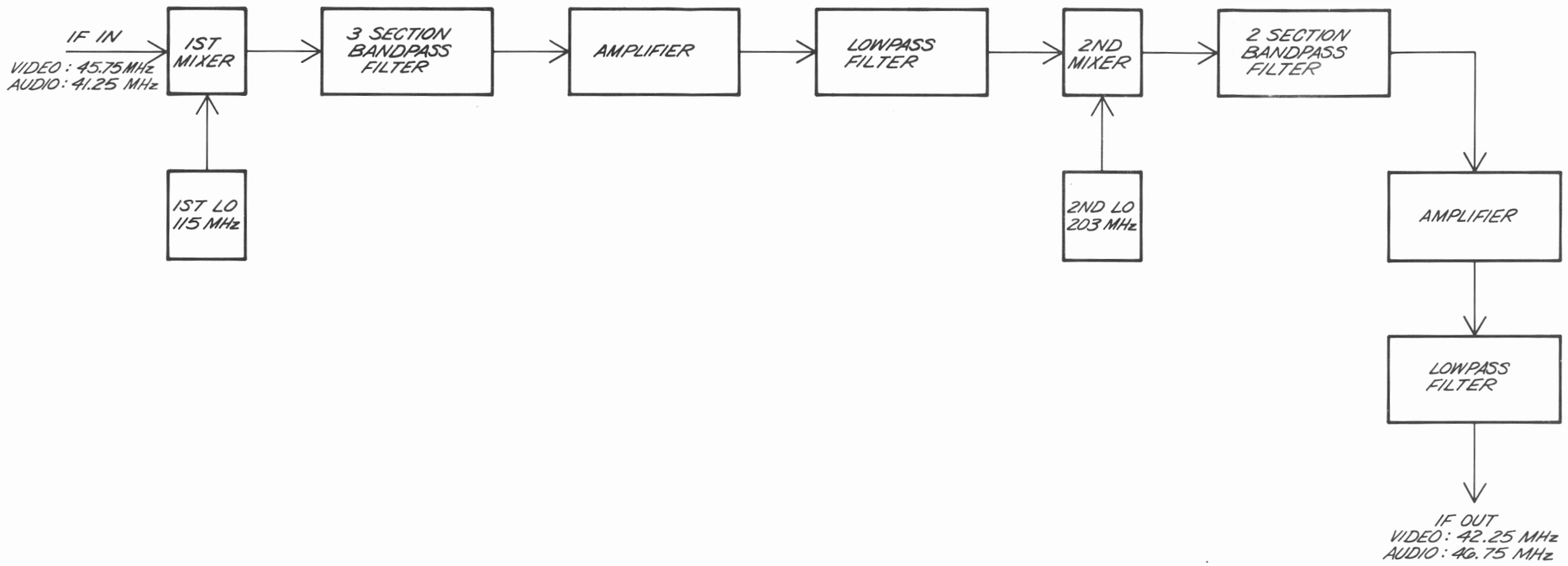
The signal leaving amplifier Q2-Q3 can be monitored at test point TP2 by repositioning plug P2 between connectors J5 and J6. A sweep signal can also be injected at test point TP3 for testing the remaining circuitry, if plug P2 is placed between connectors J6 and J7.

The signal leaving amplifier Q2-Q3 now passes through a low-pass filter L15, C26, and C28 to an input port of a second double-balanced mixer T3, T4, and CR2. The second input of the mixer is a local oscillator signal of 203 MHz. The 203-MHz local oscillator consists of oscillator transistor Q5 and amplifier transistor Q4.

The oscillator transistor is configured as an emitter follower, with feedback taken from the emitter to a tap on the base tank, through crystal Y2. A tank circuit in the base of the transistor, consisting of L25 and C50 through C52 forces the oscillator to operate at the correct overtone of the crystal. Energy is taken from the oscillator collector at the second harmonic of the crystal operating frequency. Inductor L23 and capacitor C47 form a series resonant circuit at the oscillator frequency to permit the transistor to act as a common-collector stage at the oscillating frequency. However, inductor L23 with capacitor C43 causes the collector to look like a high impedance at the second harmonic of the oscillator frequency, which is the desired output from the oscillator. The output is coupled through capacitor C41 to amplifier transistor Q4. The stage is configured as a conventional common-emitter amplifier with the collector being tuned by inductor L19 and capacitor C31. Additionally, the series-tuned circuit consisting of inductor L19 and C36 again provides a low impedance to ground from the collector at the crystal oscillating frequency to provide additional attenuation of this component. The output from the collector of transistor Q4 is taken through capacitor C30 to the second input of a double-balanced mixer. By repositioning plug P3 between connectors J9 and J10, the 203-MHz local oscillator signal will be available at test point TP3 for test purposes.

The desired outputs from the double-balanced mixer T3, T4, and CR2 are the difference frequencies of 203 MHz - 160.75 MHz = 42.25 MHz (video) and 203 MHz - 156.25 MHz = 46.75 MHz (audio). Note that this is the point where the frequency inversion actually takes place. The signals are then routed through a 2-section band-pass filter consisting of inductors L17, L21, and associated components.

The signals are further amplified in a second "Totem-pole" amplifier Q6 and Q7, and then are routed through a low-pass filter L27, L28, L29, and associated components to the IF connector J11.



230254

Figure 4-5. Spectrum Inverter Block Diagram

SECTION 5
TROUBLESHOOTING

5.1 GENERAL

This section includes troubleshooting procedures which should be of help to anyone attempting to repair a modulator that is not performing properly. Before attempting to make any repairs to the modulator, sections 3 and 4 should be read and thoroughly understood. Attempts to troubleshoot a piece of equipment without thoroughly understanding its operation generally fail. The first step in troubleshooting a defective modulator is isolating the problem to a particular module. The module may then be replaced with a spare if one is available, and the defective module repaired at leisure, or the defective module may be repaired immediately using the modulator chassis as a test fixture. To use the modulator chassis as a test fixture, remove the top cover over the rear compartment by removing the screws. All of the connections between the modules will be exposed and will permit disconnection of any RF cabling to the modules required to troubleshoot the modulator.

CAUTION

When connecting cables to the connectors in this compartment, do not overtighten the cable connector. To do so may damage the connector in the chassis. Fingertight should be sufficient for all purposes.

To gain access to the circuitry in each module, remove the top and bottom covers, as required.

If it is not desirable to perform maintenance in the field, the unit or module can be returned to Scientific-Atlanta where it can be repaired at no charge under warranty conditions; otherwise repair will be made at a nominal charge. Refer to section 1, paragraph 1.6, for information pertaining to returning equipment to Scientific-Atlanta.

5.2 SPARES

All modules except the output converter local oscillator and output converter are common to all modulators. In addition, the power supply, dc converter, output converter local oscillator, output converter, phase lock servo, phase lock output converter local oscillator, IF switch, auxiliary IF AGC, and spectrum inverter modules are common between the modulator and Scientific-Atlanta's Model 6150 Signal Processor. In systems utilizing several units, a set of common modules would form the recommended spares complement.

To aid in troubleshooting, a Model 6150 EXT Module Extender is recommended for use on all modules except the power supply. The module extender may be modified to work with the power supply.

5.3 VISUAL INSPECTION

A visual inspection of the equipment should be performed periodically. Check for overheating, frayed insulation, and cracked or burned components. Be certain that all RF connectors are securely fastened; however, do not overtighten. Note that RF connectors on the chassis which mate with the modules are intended to float, so that they will be loose.

5.4 CLEANING

The modulator should be cleaned periodically to prevent buildup of dirt, dust, grease, etc. Such buildups may raise component temperatures by inhibiting heat transfer. Some contaminants may cause corrosion, or degrade electrical performance. In order to clean effectively, use a vacuum cleaner, soft brush, or clean compressed air.

Contaminants should not be permitted to build up on printed-wiring boards. A moderately stiff brush (not a wire brush) dipped in rubbing alcohol is recommended for cleaning printed-wiring boards.

5.5 TEST EQUIPMENT REQUIRED

Most checks in this section may be made using a high quality volt-ohmmeter. For certain tests, a field strength meter, signal level meter, spectrum analyzer, and oscilloscope are desirable.

5.6 MODULE ISOLATION GUIDE

Many faults that might occur in the modulator may be traced to the particular module that is faulty, by considering the symptoms presented and by making measurements with the front-panel test points or the test points on the rear-panel barrier strip. Before attempting to troubleshoot a problem in the modulator, become familiar with sections 3 and 4 of this manual.

Should the modulator fail, verify that the power lamp on the power supply module is still illuminated. If this lamp is not illuminated, it means a failure in the power supply circuits. First check the fuse on the rear panel of the modulator. Fuse F1 is used with the normal 115V ac input and fuse F2 is used with the battery input if it is supplied. Both of these fuses are slow-blow type fuses. If these fuses are good and yet the power supply is still not operational, remove the top cover from the power supply module. The top cover is the one most removed from the printed fingers in the rear of the module. A 2-ampere fast-blow fuse in the module normally fires only if the overvoltage crowbar circuit detects an overvoltage condition. However, the fuse may fail because of internal metal fatigue, so it should be replaced if blown and the modulator should be operational again. If an overvoltage condition exists, the internal fuse will be blown again and the power supply module should be replaced with a spare unit and repaired. If the fuse is good and yet power is not available on the test points on the front panel, this probably indicates a short in the power supply bus. Remove the other modules from the modulator one at a time until power is returned. If power does not return with all modules, including options, removed, then the problem again is probably in the power supply module, which should be replaced.

If the problem is failure of the video signal to modulate the carrier, verify first using a spectrum analyzer or a field strength meter, that a carrier exists on the output of the modulator. If the carrier does exist, the problem is either in the video modulator module or is in the video switch and/or AGC options if supplied. The video switch/AGC module may be checked by temporarily removing it from the circuit. This may be done by moving the coaxial cable to the top connector behind this module. The cable should be moved to the top connector behind the video modulator. If the modulator now works, then the video switch or AGC is at fault. If the problem is not in the video switch/AGC option and yet carrier does exist on the output of the modulator, the problem is probably in the video modulator module and this module should be replaced until repairs can be effected.

In the event that no output is obtained from the RF output connector on the modulator, check the IF output connector. If output does not exist on the IF connector, this indicates a problem in either the video modulator module or in the vestigial sideband filter module. First attempt to measure the depth of modulation on the meter if the meter is installed. If the meter is reading correct depth of video modulation, then the video modulator module is good and the problem exists in the vestigial sideband filter module. On the other hand, if the meter module fails to indicate video modulation when it is known that video is being supplied, then the problem is in the video modulator module. If the meter module is not available, remove the bottom connector behind the video modulator module. This connector is normally routed to a directional coupler. Using a signal level meter check the output from this bottom connector behind the video modulator. Check for the presence of an IF signal at 45.75 MHz at a level of approximately +45 dBmV. If this signal is present, the problem is in the vestigial sideband filter module. If the signal is not present, the problem is in the video modulator module.

To check the vestigial sideband filter module, connect the field strength meter to the lowest RF connector behind the vestigial sideband filter. At this point, an IF signal whose strength is determined by the setting of the video output control on the front panel of this module should be measured. If the signal is absent at this point, then the problem is in the vestigial

sideband filter module. If the signal to the output of the vestigial sideband filter module is obtained and yet RF output is absent, verify that the IF switch option, if installed, is in the normally closed position. This may conveniently be verified by removing the center connector behind the output converter module and determining with a signal level meter that the IF signal exists on the cable. If the IF signal does exist at this point, remove the cable coming from the bottom connector behind the local oscillator module. Connect the field strength meter to this connector and check for the presence of a local oscillator signal 45.75 MHz above the picture carrier for the channel involved. The level of this signal should be approximately +56 dBmV. If this signal does not exist, then the local oscillator module has failed and should be replaced. If this signal and the modulated IF signal both exist, the output converter module is defective and should be replaced.

Should the audio carrier fail, the problem is most likely in the audio modulator module. Similarly, if the audio carrier is present but the audio fails to modulate the carrier, the problem again is in the audio module. However, before concluding that this is the problem, verify that the audio switch option is not installed in the rear compartment; or, if it is installed, temporarily unplug it to determine if it is causing the fault. Should the output signal appear normal and yet the meter fails to indicate, then the meter module would be suspect and should be replaced. Note that it is possible to replace the meter module without affecting the output signal.

If the phase lock option is supplied, a phase lock lamp on the front of the unit should illuminate when phase lock is achieved. If this lamp fails to indicate, first verify that a phase lock reference signal is being supplied on connector J4 in the rear of the modulator. Verify that the signal being supplied is at a level of at least -10 dBmV and that it is at the same frequency as the desired output from the modulator. If this signal exists and if the modulator appears to be functioning normally except that the phase lock lamp is not illuminated, then the problem is either in the output converter local oscillator or in the phase lock servo module. Note that the phase lock servo module is common for all channels and so may be exchanged for another module to determine if the fault is in this module.

The phase lock output converter local oscillator module is not common to all the channels.

If the IF switch option is supplied and fails to operate, first verify that an external IF signal is being supplied to connector J2 on the rear of the modulator and that the correct activation signal is being supplied as described in paragraph 3.8.6. If these signals are being supplied correctly and yet the switch is failing to activate, the switch module is probably defective and should be removed from the circuit or replaced until repairs can be effected.

If the IF AGC option is supplied and does not appear to be functioning normally, check first to be sure that the alternate IF signal is at the correct level for operation. The correct level of the IF AGC signal is between 18 and 38 dB below the desired output level. The nominal signal level for the alternate IF when using the IF AGC option is 28 dB below the desired output level. If the alternate IF signal is present and yet the AGC circuit does not appear to be working, check the voltage on terminal 1 of the barrier strip behind the modulator. This voltage should rise as the alternate IF input signal level rises. If the voltage does not rise as the alternate IF signal level rises, the problem is probably in the AGC option. This option may be temporarily removed from the circuit by coupling the input and output RF cables together.

If the audio switch option is supplied and fails to operate, again verify that the correct signals are being supplied to the module as described in sections 3.4 and 3.8.4. If these signals are being supplied and yet the audio switch option does not operate, the problem is most likely in this option.

5.7 VIDEO MODULATOR TROUBLESHOOTING

A possible failure in the video modulator module is indicated when there is no output from either the RF or the IF outputs on the rear of the modulator or when the RF output is present but modulation cannot be obtained. When modulation cannot be obtained, first verify that indeed a properly formatted video signal is being supplied to the modulator. First, attempt to overmodulate by turning the MODULATION DEPTH control on

the front panel clockwise to see if the WHITE CLIP lamp illuminates. If the WHITE CLIP lamp illuminates, then circuitry from the input through Q18 on the video modulator schematic diagram may be assumed to be good. In this case, the problem is most likely in the diode bridge, CR2. Should the WHITE CLIP lamp not illuminate, the best procedure is to use a high-frequency oscilloscope to probe for the presence of video on different stages through the modulator. First check for the presence of modulation on the clockwise end of the wiper of the front panel MODULATION DEPTH potentiometer. A failure to measure video at this point indicates a probable failure in the input amplifier Q1 through Q3. If video is present at this point, move to the emitter of transistor Q18 and check for the presence of video at this point. If video is not present at this point, then move progressively through stages Q6, Q8, Q10, Q13, and Q14 checking for the presence of video on the emitters of Q6, Q8, and Q18 and on the collector of Q10 and Q13 or Q14. Note that the collectors of these transistors are connected to the case so that the measurement may be conveniently made by touching the probe to the case of the transistor. Should normal video modulation be observed and yet the PEAK WHITE CLIP lamp does not illuminate at the proper time, first check the setting of clip threshold potentiometer R85 as described in paragraph 6.4.3. If it still appears that a problem exists in the peak white clip circuit, the best troubleshooting procedure would be to compare measured voltages versus voltages listed on the schematic diagram.

If the modulated video output from the video modulator is present, but the peak level appears to vary with modulation, the clamp circuit consisting of U2 and transistors Q20 and Q21 should be suspected. In the event that no signal is obtained from the video modulator module, then the oscillator transistor Q7, or the buffer transistor Q15, or the output transistor Q22 should be suspected as well as the balanced modulator diode CR2. Note that the collector of the oscillator transistor Q7 is not connected to the case.

5.8 METER MODULE TROUBLESHOOTING

Should the meter fail to indicate when it is known that modulation is present, then this module should be suspected. First, determine whether the meter fails to indicate in all three modes, VIDEO, B+, and AUDIO, or rather if it fails to indicate in one or more of these modes. Of course, verify that modulation is being supplied to the modulator and that the modulation does indeed appear on the output signal before attempting to troubleshoot the meter module. If all three meter modes are affected by the failure, then the most likely source of the problem is in the meter amplifier U6B or the calibration potentiometer R57 or in the meter movement itself. Use caution when checking the meter movement since a high current through the meter could cause permanent damage to the meter movement. Should the video section fail to indicate, measure the voltage on pin F of the module connector. This is a sample of the AGC voltage developed in the internal AGC loop. Lack of a positive voltage at this point indicates a failure in amplifier U1, in detector U2, or in the AGC transistors Q2 or Q1. If a positive voltage is present on pin F, then check for the presence of a video signal on U2, pin 4. This should be a negative sync video signal with an amplitude of several volts peak-to-peak. Follow the signal from U2, pin 4, through the emitter of transistor Q3 and to the base of transistor Q4. The emitter of transistor Q4 should be at a dc level proportional to the depth of modulation of the signal. Note that in addition to the dc level resulting from modulation of the picture carrier, a fixed 10V level will exist across C14. Modulation will raise the voltage from this 10V level.

The 10V reference is generated by operational amplifier U6A, and appears on pin 1 of U6. In addition, the reference voltage is brought back to pin E of the printed-wiring board connector.

If a voltage indicating the presence of video modulation is seen across capacitor C14, check pin 7 of operational amplifier U5. The same voltage should be present at this point. If a voltage is present at this point, yet the meter still fails to operate, check the gate of transistor Q5. The gate of this transistor is the third lead counting clockwise from the tab on the transistor as viewed from the bottom. That is, the gate is in the position

normally occupied by the collector of a bipolar transistor in a metal case. The voltage on the gate of Q5 should be +10V when the front panel meter function switch is in the VIDEO position and should be 0V at all other times.

Should the audio subcarrier fail to indicate with the B+ and VIDEO indicating, the problem is most likely in integrated circuits U3, U4, or U5A, or possibly switch transistor Q6. Supply audio modulation to the modulator and check for recovered audio on pin 1 of integrated circuit U1. Follow this audio through to the wiper of calibration potentiometer R30. If the audio is present at this point, check for the presence of audio on pin 1 of operational amplifier U5. On pin 1 the voltage should be a dc level proportional to the deviation of the audio subcarrier. Note that if the modulation being supplied is normal program material, the level on pin 1 will change fairly rapidly with the modulation. That is, the voltage on pin 1 will be 10V with no modulation in and should go positive from that potential as modulation is applied. If the voltage is not present on pin 1, check back to pin 3 of U5A. The same voltage should be present at this point. If a voltage indicating presence of modulation is not present at this point, then the problem is probably in power operational amplifier U4 or associated components. If the voltage is present on pin 1 of U5 and yet the meter fails to read, the problem is most likely in switch transistor Q6. Check the base of Q6 for the presence of a 10V signal when the front-panel meter function switch is in the AUDIO position and 0V at all other times.

5.9 AUDIO MODULATOR TROUBLESHOOTING

If baseband audio is supplied to the modulator, yet no modulation is noted on the output, first check for the presence of the audio carrier located 4.5 MHz above the picture carrier. This can usually be determined by listening for audio on a television set connected to the modulator output. If the audio from the television set is noisy, similar to when the television set is tuned to an unused channel, then no audio carrier is present. On the other hand, if the audio output from the television receiver is quiet, then the carrier is present but no audio is being modulated onto the audio carrier. In the event of loss of the audio carrier, if a meter module is available, check to see if the meter module is indicating modulation. With no carrier present but with the meter module measuring modulation, the

problem is most likely in mixer U7 in the audio modulator or in buffer amplifier U8. If the meter fails to indicate modulation, possibly by the pointer remaining above zero but at a fixed level as modulation is applied, then the problem is most likely due to the oscillator Q3 and Q4, or the buffer transistor Q5 following it or the limiter amplifier U6. These components should be checked with a voltmeter for the appropriate dc voltages. In the event that the sound carrier is present but no modulation can be achieved, first attempt to overdeviate the carrier by adjusting the front-panel DEVIATION control clockwise. A point should be reached where the OVERDEVIATION lamp on the front panel begins to flash. If the lamp fails to flash, then the problem is probably in one of the input stages processing the audio signal. When checking signals on these stages, bear in mind that a +10V level has been created by Zener diode CR17 in the audio modulator and that this voltage should appear on most of the points in the audio chain, with the audio signal superimposed on top of this voltage. Using an ac voltmeter, or preferably an oscilloscope, begin tracing the signal through the audio modulator beginning with operational amplifier U1, pin 12. Note that from the schematic diagram, this is the first active stage after audio has been supplied to the modulator. If no audio is found at this point go to the input pins E and F in the audio modulator; verify that an incoming audio signal is indeed present. Trace through from U1, pin 12, through the next stage, U1, pin 3, which is after the DEVIATION control and after pre-emphasis, and on to U1, pin 10. If a signal is present on U1, pin 3, but not on U1, pin 10, then check the switching transistor Q1. Check the voltage on the gate of U1. It should be +10V for normal operation. If this voltage is down to 0V, then the modulation is being interrupted at this point. The gate of Q1 is extended to pin M of the module printed-wiring board. If this voltage is pulled down to 0V, check the audio switch that may be installed in the modulator. Remove the switch temporarily while troubleshooting.

Should the intercarrier frequency be other than 4.5 MHz, the problem is most likely in the phase lock loop consisting primarily of integrated circuits U2, U3, and U4. Using an oscilloscope, check for the presence of an 8.8-kHz signal having a period of approximately 114 ms on U4, pin 3, and also on U4, pin 14. The signal at this point should be a square wave going from 0 to approximately +15V. If the signal is missing on pin 3,

check back to the input of divider U2, pin 10, using a x10 oscilloscope probe, for the existence of a sinusoidal waveform on pin 10. The amplitude will vary considerably depending upon the capacitance of the probe used, but should be at least 3 or 4V peak-to-peak, with the average level of the waveform approximately 7.5V. If this signal is not present, then the counter will not operate and transistor Q5 should be suspected. If a signal exists on pin 3 of U3, check pin 14 of U4. This is the reference input and is derived from a 1.125-MHz oscillator. Divider integrated circuit U3 divides the frequency of the oscillator down to the same 8.8 kHz as observed on pin 3. If the waveform is not present on pin 14, check U3, pin 10. This should be the 1.125-MHz signal having a period of approximately 889 ns. If this signal is not present, then integrated circuit U5, or crystal Y1, is to be suspected.

If a subcarrier audio signal is being used and is not being accepted by the audio modulator, first check pin P of the audio modulator printed-wiring board to verify that the voltage at this point is 0V. If the voltage here is not 0V, then the module will fail to accept the subcarrier. This voltage is supplied from the SUBCARRIER SELECT terminal on the barrier strip on the rear of the modulator. If nothing is connected to this terminal, then the voltage on pin P should be +15V. However, note that the source impedance seen is 470K so it may be loaded by the meter being used. If a voltage of 0V is on pin P, then the modulator should be in the proper mode to accept the external subcarrier. In this case, check the voltage on U5, pin 10. The voltage here should be close to +15V and the voltage on U5, pin 4, should be close to 0V. If these voltages are present, then the problem is most likely diode CR10.

5.10 VESTIGIAL FILTER MODULE TROUBLESHOOTING

The most common failure mode for the vestigial filter module would be loss of output. If loss of output from the vestigial filter module is suspected, check not only the IF output to the output converter on the lowest connector, J3, behind the module, but also check for the output to the IF output on the rear panel. This comes from connector J1 behind the vestigial filter module. If the IF output to the output converter is missing but the IF output to the rear panel is present, then suspect the amplifier consisting of Q5,

Q6, and associated components. If the IF going to the rear panel is missing and the main IF present, the problem is most likely the amplifier transistor Q4 or associated components.

If both IF outputs are missing, then the problem exists either in amplifiers Q1, Q2, or Q3, or possibly in the surface acoustic wave filter FL1. To eliminate the possibility that the problem is the surface acoustic wave filter, move the two jumpers P1 and P2 on the input and output of the filter to the alternate positions. These are shown on the printed-wiring board assembly drawing as J8 to J9, and J4 to J5. In this position, a double-sideband output from the vestigial filter module should be present. If after moving P1 and P2 to the alternate position indicated and output is still not obtained, then the problem is probably in either transistors Q1, Q2, Q3, or associated components. These may be checked best by comparing the dc voltages shown with the measured voltage on the transistors.

5.11 OUTPUT CONVERTER TROUBLESHOOTING

5.11.1 LOW BAND THROUGH SUPER BAND OUTPUT CONVERTER

The most probable failure modes of the output converter are no output or high intermodulation distortion, possibly combined with low output. When no output exists from the output converter, verify first that indeed an IF signal is being supplied to the output converter and also verify that a local oscillator signal is being supplied from the output converter local oscillator. If these signals are being supplied and if the output is zero, then the most probable failure is in the hybrid amplifier. This amplifier should be replaced. If the failure mode is high intermodulation distortion possibly accompanied by loss of output level, first verify that the local oscillator signal being supplied is at a level of at least +7 dBm (+56 dBmV); should this level be low, the performance of the output converter will suffer. If the incoming local oscillator level is normal and yet the output exhibits excessive intermodulation distortion and possibly low output level, then the problem is probably in broadband amplifier Q1 and associated components. The LO level supplied

to T2 should be approximately +13 dBm (+62 dBmV). Other possibilities are the mixer diodes CR1 or with one of the mixer transformers T1 or T2. Realignment of the module may also be required.

5.11.2 HYPERBAND OUTPUT CONVERTER

Hyperband output converter troubleshooting is basically no different from that of other lower frequency converters. The most probable failure modes are no output, or high intermodulation distortion combined with a low power output. If no output signal exists from the output converter, first verify that both the LO and the IF signals are present at J2 and J1, respectively. If these signals are present, and if the output is still zero, the most probable failure is in one of the hybrid amplifiers A1, A2, or A3. Methodically probe from the output back toward the input looking for signal to isolate the defective amplifier. If amplifier A1 is replaced and still no output is observed, then balanced mixer A4 may be the problem.

If the failure mode is high intermodulation distortion possibly accompanied by loss of output level, first verify that the local oscillator signal being supplied is at a level of at least +7 dBm (+56 dBmV). If the LO input signal level is too low, the performance of the output converter will suffer. If the incoming LO signal level is normal, and yet the output signal from the converter exhibits excessive intermodulation distortion and possibly low output level, then the problem may be associated with balanced mixer A4 or any of the hybrid amplifiers. Realignment of the module may also be required.

5.11.3 EXTENDED HYPERBAND OUTPUT CONVERTER

The most probable failure modes are no or low output, or high intermodulation distortion. If no output is present at RF OUT, verify that the LO and IF signals are present at J5 and J4, respectively. If no or low output is present, check for proper dc voltages on Q1, U2, U3, and U4. The collector and base voltages of Q1 are approximately 9.4V dc and 3.2V dc, respectively. The supply voltage on pin 2 of U2 and U3 is approximately 5.2V dc. If not, the

amplifier or one of the inductors, L12 and L14, or dropping resistors, R11, R12, and R13, may be defective. The supply voltage on pin 5 of U4 should be 19.5V dc.

The output of the mixer U1 can be observed at TP1 by moving the jumper J1 to the pins opposite the normal test position. The mixer output consists of the desired RF signal plus undesired signals such as the LO, IF, and other mixer products. With a LO IN of at least +7 dBm (+56 dBmV), the IF to RF conversion loss of the mixer U1 is approximately 7 dB. The loss in the attenuator, consisting of R9 and R10, is 5 dB.

If the signal out of the mixer U1 is correct, the most probable failure is one of the hybrid amplifiers U2, U3, or U4. The output of amplifier U2 can be checked at TP2 by moving the jumper J2 to the pins opposite the test position.

If the failure is high intermodulation distortion, verify that the local oscillator signal into LO IN is at least +7 dBm (+56 dBmV). Also verify that the IF input is not over-driving the mixer U1. The IF video carrier input level is approximately -7 dBm (+42 dBmV). The mixer output can be observed at TP1 with jumper J1 to pins opposite the test position. If the mixer output is normal, the most probable failure is one of the hybrid amplifiers. If parts are replaced, realignment of the module may be required.

5.12 OUTPUT CONVERTER LOCAL OSCILLATOR TROUBLESHOOTING

The low band through the hyperband output converter local oscillators are covered in this paragraph. The most likely failure mode of the output converter local oscillator is complete loss of output signal. If this happens, first verify that the switch inside the module, S1, is in the off-channel position. The off-channel position is toward the front of the module. Activate this switch several times to be certain that contact is being made through it. If the local oscillator still fails to operate, adjust the capacitor in the resonant circuit around to the point of oscillation. This capacitor is C6 for low band and C3 for high band. Adjust this capacitor while monitoring

the output of the local oscillator. Should oscillation begin at any setting of this capacitor, set the capacitor to the peak of the oscillation and note that in one direction the amplitude of the oscillation drops off rapidly and in the other direction the amplitude of the oscillation drops off more slowly. The capacitor should be set to the slow side of the amplitude peak. If adjusting the capacitor fails to produce an output signal, then the probable failures are in the two transistors Q1 or Q2. These can be checked by comparing the voltages on the elements against the voltages shown on the schematic diagram. Should these transistors be found to be good, the most probable cause of failure is the crystal.

5.13 PHASE LOCK TROUBLESHOOTING AND ADJUSTMENT

5.13.1 GENERAL

The phase lock circuitry is rather complex, being dependent upon two externally supplied reference signals and upon the interaction of two modules. For these reasons, field repair beyond the limits described below is not recommended. The procedures given in this section are sufficient to trace the problem to one module in most cases. The defective module should be replaced and returned to the factory for repair. If field repair is essential, study the theory of operation section and the schematics carefully and base troubleshooting procedures on them. Note that the phase lock servo and local oscillator modules are separately interchangeable without the need for any adjustments. The servo module is identical for all channels, but the local oscillator module is channel sensitive.

5.13.2 PHASE LOCK OUTPUT CONVERTER LO CHANNELS 2-13 AND A-W

Should the modulator output fail completely, the problem may be a failure of the phase lock local oscillator. This can be checked by monitoring the output from the local oscillator, obtained from the lowest RF connector on the local oscillator module. The level should be approximately +56 dBmV.

Indications of difficulty with the phase lock circuitry are failure of the phase lock indicator to illuminate when a reference signal is present. Also, if the reference signal is removed and the video carrier output frequency fails to fall within 25 kHz of the nominal carrier frequency, the trouble may be in the phase lock circuitry (see below). Before trouble-shooting the phase lock circuitry, verify that a reference signal of the proper frequency is being supplied at a minimum level of -10 dBmV. Also verify that either a proper input signal is being supplied to the modulator, or that the substitution carrier is on.

The phase lock indicator will fail to illuminate if either of two signals is missing or if the frequency error (explained below) is excessive. These conditions may be checked by measuring voltages on the connectors that the phase lock servo and local oscillator plug into. Access to these connectors may be had by removing the cover on the rear of the modulator. Voltages are measured with respect to the ground test point on the power supply module or the chassis.

In the event that the phase lock indicator fails to illuminate, check for AGC voltage on the local oscillator connector. A voltage greater than 2 volts dc should be present on the third pin from the bottom of this connector. If no voltage is present, verify with a field strength meter that a reference signal of at least -10 dBmV is incoming on the top RF connector of this module. A signal at this point, but no AGC voltage, indicates trouble in the local oscillator module.

The phase lock indicator will also fail to illuminate if a sample of the main IF signal in the modulator is not present at the upper RF connector (center position) of the phase lock servo module. Check this by measuring the voltage at the fifth pin from the top of the servo connector. A voltage here greater than 2 volts dc indicates that the servo module does not acknowledge the presence of the main IF sample. (During normal operation, 0 volts dc is present at this point. Further verification of normal operation may be obtained by switching to manual gain and reducing the gain to minimum. This will reduce the IF input below the minimum acceptable level, causing the voltage to rise above 4 volts dc. Under these conditions, phase lock cannot take place.) If the servo module doesn't acknowledge a main

IF signal, remove the upper RF cable (coming from a directional coupler) and check for an IF signal here of at least +15 dBmV (with the modulator in the AGC mode). Presence of an IF signal on this cable (with greater than 2 volts dc on the test pin) indicates a failure in the servo module. If no signal is available, a faulty cable or directional coupler is indicated.

In the event that the circuitry acknowledges the presence of both the reference and main IF signals, and yet does not go into phase lock, measure the VCXO control voltage on the fifth pin from the bottom of either module (the two are wired together). Depending upon the frequency differences involved, the voltage at this pin should be between 5 volts dc and 18 volts dc when phase lock is achieved. If either required signal is missing, the voltage should be 10 volts dc ±10% (more precisely, it should equal the voltage on the next pin up within 50 mV). This may be checked by switching to manual gain (with the gain set to minimum) or by removing the phase lock reference signal. If these actions do not cause the voltage to go to 10 volts, and the above tests have indicated normal operation, trouble with the phase lock servo is indicated.

If the voltage above is normal when a signal is removed, observe the response of the voltage when the signal is restored. If it fails to change from 10 volts (and the phase lock indicator does not illuminate), trouble is indicated in the servo module (Be certain that both required signals are acknowledged as described above.) If the voltage slowly drifts to an extreme (below 5 volts or above 18 volts), the problem may be loss of a 45.75-MHz reference signal from the local oscillator module. To check this, remove the center RF connector from the local oscillator module and check for the presence of a 45.75-MHz signal at a minimum amplitude of +30 dBmV. If this signal is not present (but a reference signal is being supplied to the phase lock input), trouble is indicated in the local oscillator module.

In the event that the voltage on the fifth pin from the bottom of the connector moves rapidly from 10 volts dc to either extreme when the required signals are restored, the problem is most likely due to an error in frequency. If a frequency counter capable of measuring the required signal frequencies is available, use the following procedure. If a suitable counter is not available, the factory should be consulted at this point. Before assuming that a problem exists with the phase lock circuitry, be certain that the reference signal being supplied and the input signal being supplied are at the correct frequency. If the difference between these two frequencies is greater than 25 kHz, then acquisition is not possible. If phase lock must be maintained under these conditions, consult the factory.

Measure the picture carrier frequency at the output of the modulator with no phase lock reference signal applied. It should be within 25 kHz of the nominal output frequency and within 25 kHz of the reference frequency. If it is not within this frequency range, measure the main IF frequency in the modulator. This may be done by disconnecting the input to the directional coupler and measuring the frequency on this cable. The frequency should be 45.75 MHz ±10 kHz. If it is not within this range, refer to the trouble-shooting procedure for the modulator given in paragraph 5.7. If this IF signal is at the correct frequency, the trouble probably lies with the voltage-controlled crystal oscillator (VCXO) in the local oscillator. This may be most easily corrected by placing the local oscillator on an extender after removing the top cover (the cover closest to the RF connectors) from the module. If possible, measure the local oscillator frequency, available from the lowest RF connector on the local oscillator. The frequency should be 45.75 MHz above the nominal picture carrier frequency. Alternatively, the output picture carrier frequency may be monitored if the main IF frequency

has been determined to be accurate. With no reference signal supplied, adjust the VCXO frequency by adjusting the slug in the coil (L2 low band; L1 high band). This coil is the coil closest to the front of the module within the semishielded area. (The frequency may be expected to shift by up to 2 kHz when the cover is replaced, but this is unimportant for most applications.)

If the unit is phase lock, the VCXO frequency may be set by monitoring the voltage on the fifth pin from the bottom of either the local oscillator or the servo connector. When the local oscillator frequency is adjusted such that the non-phaselock output frequency and the reference frequency are nearly equal, this voltage will be nearly equal to that on the next pin up (nominally 10 volts dc).

5.13.3 HYPERBAND AND EXTENDED HYPERBAND PHASE LOCK OUTPUT CONVERTER LO CHANNELS AA-WW

Should the modulator output fail completely, the problem may be a failure of the phase lock local oscillator. This can be checked by monitoring the output from the local oscillator, obtained from the lowest RF connector on the local oscillator module. The level should be approximately +59 dBmV.

Indications of difficulty with the phase lock circuitry are failure of the phase lock indicator to illuminate when a reference signal is present. Also, if the reference signal is removed and the video carrier output frequency fails to fall within 25 kHz of the nominal carrier frequency, the trouble may be in the phase lock circuitry (see below). Before troubleshooting the phase lock circuitry, verify that a reference signal of the proper frequency is being supplied at a minimum level of +1 dBmV. Also verify that either a proper input signal is being supplied to the modulator, or that the substitution carrier is on.

The phase lock indicator will fail to illuminate if either of two signals is missing or if the frequency error (explained below) is excessive. These conditions may be checked by measuring voltages on the connectors that the phase lock servo and local oscillator plug into. Access to

these connectors may be had by removing the cover on the rear of the modulator. Voltages are measured with respect to the ground test point on the power supply module or the chassis.

In the event that the phase lock indicator fails to illuminate, check for AGC voltage on the local oscillator connector. A voltage greater than 2 volts dc should be present on the third pin from the bottom of this connector. If no voltage is present, verify with a field strength meter that a reference signal of at least +1 dBmV is incoming on the top RF connector of this module. A signal at this point, but no AGC voltage, indicates trouble in the local oscillator module.

The phase lock indicator will also fail to illuminate if a sample of the main IF signal in the modulator is not present at the upper RF connector (center position) of the phase lock servo module. Check this by measuring the voltage at the fifth pin from the top of the servo connector. A voltage here greater than 2 volts dc indicates that the servo module does not acknowledge the presence of the main IF sample. (During normal operation, 0 volts dc is present at this point. Further verification of normal operation may be obtained by switching to manual gain and reducing the gain to minimum. This will reduce the IF input below the minimum acceptable level, causing the voltage to rise above 4 volts dc. Under these conditions, phase lock cannot take place.) If the servo module doesn't acknowledge a main IF signal, remove the upper RF cable (coming from a directional coupler) and check for an an IF signal here of at least +15 dBmV (with the modulator in the AGC mode). Presence of an IF signal on this cable (with greater than 2 volts dc on the test pin) indicates a failure in the servo module. If no signal is available, a faulty cable or directional coupler is indicated.

In the event that the circuitry acknowledges the presence of both the reference and main IF signals, and yet does not go into phase lock, measure the VCXO control voltage on the fifth pin from the bottom of either module (the two are wired together). Depending upon the frequency differences involved, the voltage at this pin should be between 5 volts dc and 18 volts dc when phase lock is achieved. If either required signal is missing, the voltage should be 10 volts dc ±10% (more precisely, it should equal the voltage on the next pin up within 50 mV). This may be checked by switching to manual gain

(with the gain set to minimum) or by removing the phase lock reference signal. If these actions do not cause the voltage to go to 10 volts, and the above tests have indicated normal operation, trouble with the phase lock servo is indicated.

If the voltage above is normal when a signal is removed, observe the response of the voltage when the signal is restored. If it fails to change from 10 volts (and the phase lock indicator does not illuminate), trouble is indicated in the servo module. (Be certain that both required signals are acknowledged as described above.) If the voltage slowly drifts to an extreme (below 5 volts or above 18 volts), the problem may be loss of a 45.75 MHz reference signal from the local oscillator module. To check this, remove the center RF connector from the local oscillator module and check for the presence of a 45.75 MHz signal at a minimum amplitude of +30 dBmV. If this signal is not present (but a reference signal is being supplied to the phase lock input), trouble is indicated in the local oscillator module.

In the event that the voltage on the fifth pin from the bottom of the connector moves rapidly from 10 volts dc to either extreme when the required signals are restored, the problem is most likely due to an error in frequency. This may be due to the synthesizer being out of lock. To check this, check the voltage on resistor R24 (either end, refer to figure 5-1). This point should measure 5.0 ± 0.5V. If not, try adjusting VCO tuning capacitor C4 (refer to figure 5-1) until the latter voltage is measured on resistor R24. If this adjustment cannot be made, a synthesizer failure is evident and the factory should be consulted (phone 404-925-5300 within Georgia; 800-241-1966, ext. 5300, outside of Georgia). If a frequency counter capable of measuring the required signal frequencies is available, use the following procedure. If a suitable counter is not available, the factory should be consulted at this point. Before assuming that a problem exists with the phase lock circuitry, be certain that the reference signal being supplied and the input signal being supplied are at the correct frequency. If the difference between these two frequencies is greater than 17 kHz, then acquisition is not likely. If phase lock must be maintained under these conditions, consult the factory (refer to phone numbers listed above).

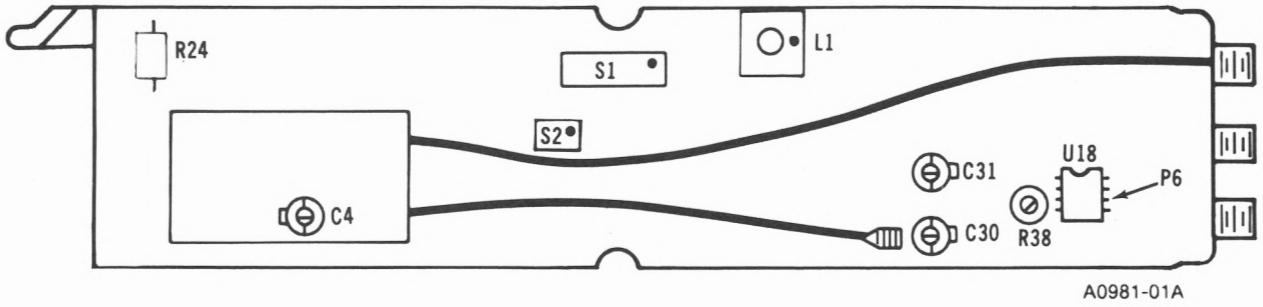


Figure 5-1. Hyperband Phase Lock Output Converter LO Component Locations Requiring Adjustments

Measure the picture carrier frequency at the output of the modulator with no phase lock reference signal applied. It should be within 17 kHz of the nominal output frequency and within 17 kHz of the reference frequency. If it is not within this frequency range, measure the main IF frequency in the modulator. This may be done by disconnecting the input to the directional coupler and measuring the frequency on this cable. The frequency should be 45.75 MHz ±17 kHz. If it is not within this range, refer to the troubleshooting procedure for the modulator given in paragraph 5.7. If this IF signal is at the correct frequency, the trouble probably lies with the synthesizer in the local oscillator. This may be most easily corrected by placing the local oscillator on an extender (after removing the top cover closest to the RF connectors from the module). If possible, measure the local oscillator frequency, available from the lowest RF connector on the local oscillator. The frequency should be 45.75 MHz above the nominal picutre carrier frequency. Alternatively, the output picture carrier frequency may be monitored if the main IF frequency has been determined to be accurate. With no reference signal supplied, adjust the synthesizer frequency by adjusting the slug in the coil L1. This coil is located in the rear of the module and is the largest shielded coil. The frequency may be expected to shift by up to 2 kHz when the cover is replaced, but this is unimportant in most applications.

If the unit is phase lock, the synthesizer frequency may be set by monitoring the voltage on the fifth pin from the bottom of either the local oscillator or the servo connector. When the local oscillator frequency is adjusted such that the non-phaselock output frequency and the reference frequency are

nearly equal, this voltage will be nearly equal to that on the next pin up (nominally 10 volts dc).

5.13.4 RECHANNELIZING HYPERBAND PHASE LOCK OUTPUT CONVERTER LOCAL OSCILLATORS

Since the hyperband phase lock output converter local oscillator uses a synthesizer for frequency generation, the units may be rechannelized in the field, if necessary, to any harmonic or incremental channel in the same band (refer to table 5-1 or 5-2) using only a VOM. Note, however, that the associated output converter is set up to a specific channel. This procedure is intended, therefore, to be used when it is desired to set up a spare LO unit for a specific channel or when one hyperband channel is to be sacrificed, temporarily, for another, in the event of a hyperband LO module failure.

PROCEDURE

Remove the module cover of the unit to be rechannelized, exposing the component side of the printed-wiring board. Place the unit on a module extender and apply power. Be sure that the unit is phase locked before rechannelizing.

Reset the DIP switches S1 and S2 (refer to figure 5-1) according to the desired incremental or harmonic channel settings listed in tables 5-1 and 5-2, respectively. Monitor resistor R24, either end (refer to figure 5-1). Adjust VCO tuning capacitor C4 with a plastic-tip tool for 5.0 ± 0.5V indication on resistor R24. Monitor U18, pin 6 and peak capacitors C30 and C31 for maximum voltage. Replace the module cover and temporarily mark the front panel to indicate the channel change.

TABLE 5-1. HYPERBAND AND EXTENDED HYPERBAND PHASE LOCK LO INCREMENTAL CHANNEL SPACING FREQUENCY PROGRAMMING CODES

	CHANNEL	COMB FREQUENCY (MHz)	LO FREQUENCY (MHz)	X = Closed (On) O = Open (Off) SWITCH S1 1	2	3	4	5	6	7	8	SWITCH S2 1	2	3	4
	J	217.25	263.00	O	X	X	O	O	O	O	X	O	X	O	O
	K	223.25	269.00	O	X	X	O	O	X	O	X	O	X	X	O
	L	229.25	275.00	O	X	X	O	X	O	X	X	O	O	O	O
	M	235.25	281.00	O	X	X	O	X	X	X	X	O	O	X	O
	N	241.25	287.00	O	X	X	X	X	O	O	O	O	O	O	X
	O	247.25	293.00	O	X	X	X	O	O	X	O	O	X	O	O
	P	253.25	299.00	O	X	X	X	O	X	X	O	O	X	X	O
	Q	259.25	305.00	O	X	X	X	X	O	O	X	O	O	O	O
	R	265.25	311.00	O	X	X	X	X	X	O	X	O	O	X	O
	S	271.25	317.00	O	X	X	X	X	O	X	X	O	O	O	X
	T	277.25	323.00	X	O	O	O	O	O	O	O	O	X	O	O
	U	283.25	329.00	X	O	O	O	O	X	O	O	O	X	X	O
	V	289.25	335.00	X	O	O	O	X	O	X	O	O	O	O	O
	W	295.25	341.00	X	O	O	O	X	X	X	O	O	O	X	O
	AA	301.25	347.00	X	O	O	O	X	O	O	X	O	O	O	X
	BB	307.25	353.00	X	O	O	O	O	O	X	X	O	X	O	O
LOW	CC	313.25	359.00	X	O	O	O	O	X	X	X	O	X	X	O
	DD	319.25	365.00	X	O	O	X	X	O	O	O	O	O	O	O
	EE	325.25	371.00	X	O	O	X	X	X	O	O	O	O	X	O
	FF	331.25	377.00	X	O	O	X	X	O	X	O	O	O	O	X
	GG	337.25	383.00	X	O	O	X	O	O	O	X	O	X	O	O
	HH	343.25	389.00	X	O	O	X	O	X	O	X	O	X	X	O
MID	II	349.25	395.00	X	O	O	X	X	O	X	X	O	O	O	O
	JJ	355.25	401.00	X	O	O	X	X	X	X	X	O	O	X	O
	KK	361.25	407.00	X	O	X	O	X	O	O	O	O	O	O	X
	LL	367.25	413.00	X	O	X	O	O	O	X	O	O	X	O	O
	MM	373.25	419.00	X	O	X	O	O	X	X	O	O	X	X	O
	NN	379.25	425.00	X	O	X	O	X	O	O	X	O	O	O	O
HIGH	OO	385.25	431.00	X	O	X	O	X	X	O	X	O	O	X	O
	PP	391.25	437.00	X	O	X	O	X	O	X	X	O	O	O	X
	QQ	397.25	443.00	X	O	X	X	O	O	O	O	O	X	O	O
	RR	403.25	449.00	X	O	X	X	O	X	O	O	O	X	X	O
	SS	409.25	455.00	X	O	X	X	X	O	X	O	O	O	O	O
EXTENDED HYPERBAND	TT	415.25	461.00	X	O	X	X	X	X	X	O	O	O	X	O
	UU	421.25	467.00	X	O	X	X	X	O	O	X	O	O	O	X
	VV	427.25	473.00	X	O	X	X	O	O	X	X	O	X	O	O
	WW	433.25	479.00	X	O	X	X	O	X	X	X	O	X	X	O

TABLE 5-2. HYPERBAND AND EXTENDED HYPERBAND PHASE LOCK LO HARMONIC CHANNEL SPACING FREQUENCY PROGRAMMING CODES

	CHANNEL	COMB FREQUENCY (MHz)	LO FREQUENCY (MHz)	X = Closed (On) / O = Open (Off) SWITCH S1 1	2	3	4	5	6	7	8	SWITCH S2 1	2	3	4
	J	216.00	261.75	O	X	X	O	X	X	X	O	X	X	X	O
	K	222.00	267.75	O	X	X	O	O	X	O	X	X	O	O	O
	L	228.00	273.75	O	X	X	O	O	O	X	X	X	O	X	O
	M	234.00	279.75	O	X	X	O	O	X	X	X	X	O	O	X
	N	240.00	285.75	O	X	X	X	X	O	O	O	X	X	O	O
	O	246.00	291.75	O	X	X	X	X	X	O	O	X	X	X	O
	P	252.00	297.75	O	X	X	X	O	X	X	O	X	O	O	O
	Q	258.00	303.75	O	X	X	X	O	O	O	X	X	O	X	O
	R	264.00	309.75	O	X	X	X	O	X	O	X	X	O	O	X
	S	270.00	315.75	O	X	X	X	X	O	X	X	X	X	O	O
	T	276.00	321.75	O	X	X	X	X	X	X	X	X	X	X	O
	U	282.00	327.75	X	O	O	O	O	X	O	O	X	O	O	O
	V	288.00	333.75	X	O	O	O	O	O	X	O	X	O	X	O
	W	294.00	339.75	X	O	O	O	O	X	X	O	X	O	O	X
LOW	AA	300.00	345.75	X	O	O	O	X	O	O	X	X	X	O	O
LOW	BB	306.00	351.75	X	O	O	O	X	X	O	X	X	X	X	O
LOW	CC	312.00	357.75	X	O	O	O	O	X	X	X	X	O	O	O
LOW	DD	318.00	363.75	X	O	O	X	O	O	O	O	X	O	X	O
LOW	EE	324.00	369.75	X	O	O	X	O	X	O	O	X	O	O	X
LOW	FF	330.00	375.75	X	O	O	X	X	O	X	O	X	X	O	O
MID	GG	336.00	381.75	X	O	O	X	X	X	X	O	X	X	X	O
MID	HH	342.00	387.75	X	O	O	X	O	X	O	X	X	O	O	O
MID	II	348.00	393.75	X	O	O	X	O	O	X	X	X	O	X	O
MID	JJ	354.00	399.75	X	O	O	X	O	X	X	X	X	O	O	X
MID	KK	360.00	405.75	X	O	X	O	X	O	O	O	X	X	O	O
MID	LL	366.00	411.75	X	O	X	O	X	X	O	O	X	X	X	O
MID	MM	372.00	417.75	X	O	X	O	O	X	X	O	X	O	O	O
HIGH	NN	378.00	423.75	X	O	X	O	O	O	O	X	X	O	X	O
HIGH	OO	384.00	429.75	X	O	X	O	O	X	O	X	X	O	O	X
HIGH	PP	390.00	435.75	X	O	X	O	X	O	X	X	X	X	O	O
HIGH	QQ	396.00	441.75	X	O	X	O	X	X	X	X	X	X	X	O
EXTENDED HYPERBAND	RR	402.00	447.75	X	O	X	X	O	X	O	O	X	O	O	O
EXTENDED HYPERBAND	SS	408.00	453.75	X	O	X	X	O	O	X	O	X	O	X	O
EXTENDED HYPERBAND	TT	414.00	459.75	X	O	X	X	O	X	X	O	X	O	O	X
EXTENDED HYPERBAND	UU	420.00	465.75	X	O	X	X	X	O	O	X	X	X	O	O
EXTENDED HYPERBAND	VV	426.00	471.75	X	O	X	X	X	X	O	X	X	X	X	O
EXTENDED HYPERBAND	WW	432.00	477.75	X	O	X	X	O	X	X	X	X	O	O	O

5.14 SOLID STATE SWITCH TROUBLESHOOTING

Refer to figures 8-42 and 8-43 for the schematic diagram and component location diagram for the optional solid state switch. The solid state switch is located in the rear compartment of the modulator behind the module connectors, when this option is supplied. Trouble with the switch is indicated if either path controlled by the switch fails to operate. Before suspecting trouble with the switch itself, verify that power is applied to the switch and that the correct switch command is being applied.

Operation of the switch is controlled by transistor pair Q2 and Q3. The voltage on the collector of these two transistors will take on two different states as explained in section 4, depending upon whether the switch is activated or not. Transistors Q2 and Q3 should always be in opposite states. If not, then the trouble is indicated in one of transistors Q1 through Q4. Transistor Q5 is only operational in the circuit if the switch is activated by a positive voltage applied to feed-through capacitor C20. Note that if an external contact closure is being used, the voltage must approach very closely to ground to ensure that the switch will operate properly. The switch itself is composed of diodes CR1 through CR8. These diodes may be individually tested with an ohmmeter. Small signal silicon diodes are used in this application. If the exact replacement diode is not available another suitable diode may be substituted.

5.15 VIDEO SWITCH TROUBLESHOOTING

Should the video switch option fail to operate, determine whether the main video channel on connector J1 is affected or whether the alternate video input on connector J3 is affected, or if both are affected. If only the main video is affected, the problem is most likely a failure associated with transistors Q1 through Q7. If the alternate video is affected, the failure probably involves transistors Q14 through Q19. If both inputs fail to yield an output, the problem is most likely in the transistors common to both inputs Q10 through Q13.

Should the switch fail to activate upon loss of the main video signal, the fault most likely lies in integrated circuit U1 or transistors Q4, Q8, or Q9. In this case, check the voltage on U1, pin 1, while main video signal is present. The voltage on pin 1 should be close to 20V and with the main video signal removed, the voltage on pin 1 should drop close to 0V. If this fails to happen, then integrated circuit U1 or possibly transistor Q4 should be suspected. If the voltage on U1, pin 1, is correct and yet the switch fails to activate, the problem is most likely in transistors Q8, Q9, Q7, or Q19.

5.16 VIDEO AGC TROUBLESHOOTING

If the video AGC option fails to operate, first verify that a video signal with amplitude between 0.5 and 2V peak-to-peak is being supplied to the video AGC module. A no output problem would indicate trouble in the circuitry associated with transistors Q1 through Q7. Failure to maintain a constant output level as the input level changes may be an indication of trouble in the light dependent resistor LDR1 or in the remainder of the circuitry shown on the schematic diagram. If a high frequency oscilloscope is available, trigger the oscilloscope from the incoming video at a line rate and check the signal present on the collector of transistor Q17. The collector of Q17 is connected to the case. The waveform on the collector of transistor Q17 should be a rectangular waveform normally at 0V but rising to 10V during the back-porch interval of the incoming video signal. If this waveform is not present, move back to integrated circuit U1, pin 7,

and look for a negative-going rectangular waveform. At this point, the rectangular waveform should occur just on the trailing edge of the sync pulse.

Another useful troubleshooting technique to be applied when the AGC module fails to normalize the gain of the incoming video is to switch to the manual gain mode and adjust the front panel manual gain potentiometer. If adjusting this potentiometer does cause a change in the level of the video being modulated, then the sync separator or the feedback loops involving integrated circuits U2 through U4 and associated components should be suspected. If adjusting the manual gain control fails to yield a change in the output level, suspicion should center around transistors Q21 or Q22 or the light dependent resistor LDR1.

5.17 VIDEO SWITCH AND AGC TROUBLESHOOTING

The video switch and AGC option is composed of the video switch option followed by the video AGC option; troubleshooting of these individual options is discussed in paragraphs 5.15 and 5.16, respectively. Refer to these discussions for troubleshooting of the combined video switch and AGC option.

5.18 AUDIO SWITCH TROUBLESHOOTING

The most likely failure modes of the audio switch would be failure to activate one or the other of the two inputs to the switch or failure to turn off the main audio when the audio switch is activated. If the latter failure mode exists, measure the voltage on pin M on the audio modulator connector; the voltage should be +10V during normal operation and should drop to 0V when either of the alternate audio or the override audio is selected. If this fails to happen, then suspect either integrated circuit U2 or diodes CR4 or CR5 on the audio switch option. If the voltage on pin M does drop to 0V yet the main audio is not turned off, the problem is in transistor Q1 of the audio modulator.

Should the audio switch fail to accept either the alternate audio or the override audio input, supply a signal to the switch. Using an oscilloscope or ac voltmeter check for an output on pin 1 of U1 for the alternate audio or

pin 7 of U1 for the override audio. The amplitude of the signal on these pins should be equal to the differential amplitude of the incoming signal level. If this voltage is not present, then operational amplifier U1 is probably at fault. If this voltage is present and yet the switch will not accept the alternate audio or the override audio, the problem is either in integrated circuit U3 or integrated circuit U2. Check the dc voltage on U3, pin 3. The voltage on this pin should be approximately +18 volts when either the override audio or the alternate audio is selected and should be 8 to 10 volts when neither alternate nor override audio is selected. If this voltage is not correct, then suspect integrated circuit U2.

CAUTION

Integrated circuit U2 is a CMOS integrated circuit. Special handling precautions apply to CMOS integrated circuits.

Should the voltage on pin 3 of U3 be as stated above, the problem is most likely in integrated circuit U2.

5.19 AUDIO MODULATOR LIMITER TROUBLESHOOTING

Trouble is indicated with the audio modulation limiter if deviation exceeding 25 kHz is observed when the modulation limiter is installed, or if when the modulation limiter is installed, normal deviation is not possible. In the event that overdeviation is observed with the modulation limiter installed, first verify that terminal 12 on the rear-panel barrier strip is not grounded. If terminal 12 is grounded, the modulation limiter function will be defeated. However, no damage will occur. Should improper operation be noted, first remove the top cover from the audio modulator module and termporarily unplug the 6-connector flat cable protruding from the modulation limiter option. With this unplugged, normal operation of the audio circuitry should be observed. Establish a point at which overdeviation is occurring and plug the audio modulation limiter back in. Measure the voltage on terminal 12 of the rear-panel barrier strip. The voltage on this barrier strip

terminal should be a positive-going voltage whose level is as described in table 3-3. If this voltage exists and yet the modulation limiter fails to operate, the problem is most likely in integrated circuit U1 in the audio modulation limiter. If this voltage on terminal 12 of the barrier strip does not exist, first measure the voltage on pin 3 of integrated circuit U2 in the modulation limiter. The voltage on this pin should be fixed at +10V. If this voltage doesn't exist, then integrated circuit U2 is probably defective. If the voltage on pin 3 of U2 does exist, and yet the proper voltage does not appear on terminal 12 of the rear-panel barrier strip, check the voltage on pin 4 of U2 in the audio modulation limiter. The voltage on pin 4 should be approximately +10V until overdeviation occurs. When overdeviation occurs, the voltage on this pin should drop below 10V. If the voltage at this point does drop below 10V, then the problem is probably with transistor Q1 on the modulation limiter. If the voltage on U2, pin 4, does not drop during periods of overdeviation, then the problem again is most likely in integrated circuit U2.

5.20 AUXILIARY IF AGC TROUBLESHOOTING

Trouble in the auxiliary IF AGC module is indicated if a maximum gain of 20 dB cannot be obtained, or if AGC action is improper. If no output can be obtained at 45.75 MHz, transistor Q1 or transistor Q2 is probably defective. These transistors can be checked by comparing the voltages on the elements against the voltages shown in figure 8-40. When the problem appears to be low gain, first verify that the voltage on the AGC test point is 0V. Voltage at this point indicates that the circuit gain is being reduced by the AGC circuitry. Remove the input signal and again measure the voltage on the AGC TEST point. If the voltage drops to 0V, then check the input and output signal levels desired as described in paragraph 3.8.7. If the voltage on the AGC TEST point remains above 0V with no input signal, the problem is probably with integrated circuits U2 or U3, or transistor Q3.

Remove the cover from the module by removing the nuts holding the cover to the two RF connectors. Check the voltage on U3, pin 5. With no input signal, the voltage at this point should be 0V. If this does not occur, check the voltage on pin 1 of U3. With no input signal, the voltage at this point should be above 7V. If the voltage on pin 1 is above 7V and on pin 5 is above 0V, then integrated circuit U3 is probably defective. If with no input signal the voltage on pin 1 of U3 is below approximately 7V, the problem is probably with integrated circuit U2.

If the circuit fails to exhibit AGC action, first verify that the incoming signal level is nominally 10 dB below the desired level out of the module. Rotate the level control potentiometer R12 bolted to the side of the housing, through its entire range. Verify no change in the output level. Again measure, preferably with a dc-coupled oscilloscope, the voltage on U3, pin 1. With a modulated video signal applied to RF IN connector J1, the waveform observed on pin 1 should be a somewhat distorted video signal with negative sync. If the AGC circuitry is inoperative, the peak-to-peak amplitude of the video should rise and the dc level of the sync tips should drop with increasing signal level or with turning the output level control R12 counterclockwise. If this fails to happen, the problem is most likely with integrated circuit U1 or integrated circuit U2. The output of integrated circuit U1 on pin 6 is the RF signal being handled by the auxiliary IF AGC module. If a high frequency oscilloscope with response to at least 50 MHz is available, it should be possible to see the envelope of the IF signal on U1, pin 6 or U2, pin 7.

5.21 SPECTRUM INVERTER TROUBLESHOOTING

Failure of the spectrum inverter may result in no RF output, low RF output, or off-frequency operation.

Check first to determine that plugs P1, P2, and P3 are in their normal operating positions (refer to paragraph 4.3.17). Next, check to determine if IF signals at a useable level are available at input connector J1. Normal signal levels are:

Video IF (45.75 MHz)	+25 to 40 dBmV (see note)
Sound IF (41.25 MHz)	+10 to 25 dBmV (see note)

Note

The above signal levels depend on the video and sound level panel settings.

Next, check both local oscillators for proper level and frequency. Check at test points TP1 and TP3 after moving plugs P1 and P3 to determine that the appropriate signals are directed to the test points, as follows:

Test Point	Frequency	Level Range (dBmV)
TP1	115 MHz ±3 kHz	+55 to +61
TP2	203 MHz ±5 kHz	+55 to +61

Failure of either oscillator may be due to a defective part or it may be due to an improperly turned oscillator. Check first for proper dc levels. A slight re-adjustment of capacitor C11 in the 115-MHz oscillator or capacitor C52 in the 203-MHz oscillator may restore operation.

Note

Plugs P1 and P3 must be restored to the operational positions after checking the oscillator signals.

If both oscillators are normal, the problem will be most likely in either amplifier Q2-Q3 or amplifier Q6-Q7. Operation of the spectrum inverter up to the output of amplifier Q2-Q3 can be checked at test point TP2 by repositioning plug P2 between connectors J5 and J6. Note that the video carrier frequency at this point is 160.75 MHz (desired level is +8 to +23 dBmV). Return plug P2 to the operational position after this test.

The final test point is the IF output connector J11. The desired frequencies and levels are:

	Frequency	Level (dBmV)
Video	42.25 MHz	+25 to +40
Audio	46.75 MHz	+10 to +25

The module overall gain should be 0 ±2 dB.

SECTION 6
ALIGNMENT

6.1 GENERAL

This section includes information required to properly align the Model 6350 Television Modulator. Alignment should not be undertaken unless a repair has been made or unless the modulator is known to require alignment. Even then, alignment should not be undertaken unless required test equipment, properly calibrated, is available. The person attempting alignment should be thoroughly familiar with the theory of operation of the module.

6.2 TEST EQUIPMENT

Each section below includes a list of equipment required for a specific alignment procedure. Equipment model numbers are not specified; however, the significant performance requirements are specified. The person attempting alignment is responsible for assuring that his equipment is capable of performing as required.

In addition to the equipment listed in each section, a module extender is required. The same extender, Scientific-Atlanta Model 6150-EXT is used for signal processors, modulators, and demodulators. These extenders are available from your Scientific-Atlanta sales representative.

6.3 POWER SUPPLY ALIGNMENT

The only alignment required of the power supply is an adjustment of the output voltage. This voltage may be measured on the front-panel test points. Control R11 (see figure 8-2), located near the front of the module controls the voltage. It should be adjusted for a regulated voltage of 20 ±0.5 volts.

6.4 VIDEO MODULATOR ADJUSTMENTS

This section includes the test equipment and procedures to properly align the video modulator module. Refer to figure 6-1 for the component location of components that require adjustment.

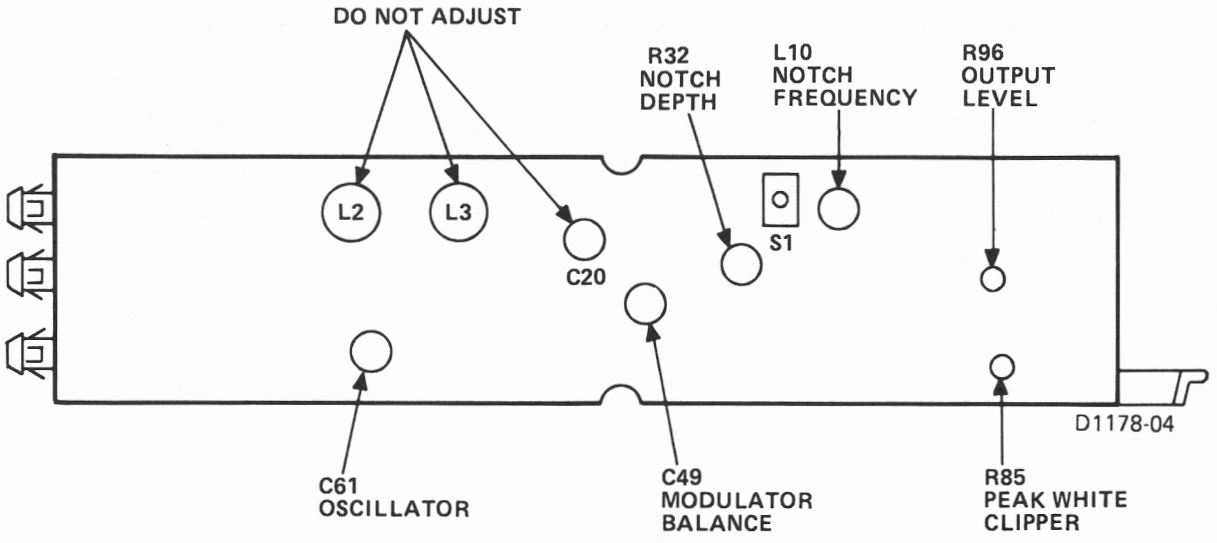


Figure 6-1. Video Modulator Component Location

6.4.1 TEST EQUIPMENT REQUIRED

a. Signal level meter or spectrum analyzer

b. Frequency counter capable of measuring 45.75 MHz accurate to ±100 Hz

c. Signal generator capable of driving a 4.5 MHz (±1 kHz) signal into a 75-ohm load at a level of -10 dBm

d. Video waveform generator capable of generating an unmodulated video ramp and staircase

e. Oscilloscope capable of accurately measuring a 50-MHz modulated envelope

Remove the top cover (the one farthest from the printed-wiring board), and place the module on an extender. Remove the cover on the top rear of the modulator.

6.4.2 45.75-MHz OSCILLATOR ADJUSTMENT

Connect the signal level meter or spectrum analyzer to connector J2, the center connector behind the module. Adjust capacitor C61 for maximum output at 45.75 MHz. As C61 is turned from the maximum output, the amplitude will drop faster with rotation in one direction than the other. The capacitor should be set on the "slow" side of the peak. Output level should be +50 dBmV ±2 dB. Using the frequency counter, verify a frequency of 45.75 MHz ±1 kHz. Reconnect the cable removed from connector J2.

6.4.3 IF OUTPUT LEVEL

Monitor J3, the bottom connector behind the modulator, with the signal level meter or spectrum analyzer. Do not apply video modulation.

Set potentiometer R85 to the maximum counterclockwise position. Set potentiometer R96 for an output of +46 dBmV at 45.75 MHz, on connector J3.

6.4.4 4.5-MHz NOTCH

Note

This procedure may be omitted
if use of the trap is not desired.

Monitor J3, the lowest connector behind the video modulator, with the spectrum analyzer or signal level meter set to indicate response at 41.25 MHz. Connect the 4.5-MHz oscillator to the main video input on the rear of the modulator. Set the level to -10 dBm. Place the trap switch, S1 in the module, to the "OUT" position (toward the center of the module).

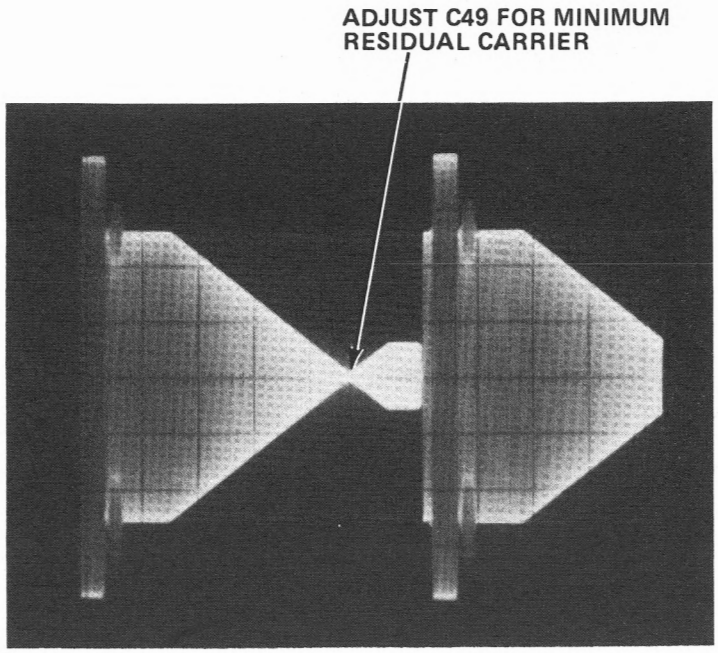
Adjust the amplitude of the 4.5-MHz signal slightly to place the 41.25-MHz output component -20 dB from the peak of the 45.75-MHz IF signal. Switch in the trap.

Adjust L10 for maximum attenuation of the 41.25-MHz component, then adjust R32 to place this component 32 dB below the picture carrier. Return the trap switch to the "OUT" position unless it is desired to use the trap at this time.

Note that this procedure results in a notch depth of 11 dB. A greater notch depth is possible, but adjusting to greater notch depth will result in increased group delay error.

6.4.5 MODULATOR BALANCE ADJUSTMENT

Supply an unmodulated ramp video signal to the modulator, and monitor the output on connector J3, behind the video modulator, with a high frequency oscilloscope. Trigger the oscilloscope from the line rate of the video, and set the controls to display at least one video line. Adjust peak white clipper R85 to the extreme counterclockwise stop. Intentionally overmodulate the video carrier. Adjust balance capacitor C49 to obtain a point which the envelope of the carrier passes through 0, as shown in figure 6-2. Expand the oscilloscope trace to obtain a more accurate setting.



D1178-26

Figure 6-2. Modulator Balance Oscilloscope Trace

6.4.6 WHITE LEVEL CLIPPER

Verify that the carrier level present on connector J3, behind the video modulator, is at a level of +46 dBmV with no modulation present. Connect a waveform generator set to produce an unmodulated staircase, to the video input. Connect the high frequency oscilloscope to J3 and set it to display one or two lines of video. Adjust the oscilloscope vertical sensitivity to display 30 divisions between peak negative and peak positive envelope as shown in figure 6-3. Adjust the front-panel MODULATION DEPTH control for 1.5 divisions where the staircases come together on the right of a line. Slowly adjust R85 clockwise until the WHITE CLIP lamp illuminates.

Turn the MODULATION DEPTH control down, then turn it, observing that the WHITE CLIP lamp illuminates at 95% depth of modulation (1.5 divisions), and that the modulation is limited to approximately 97% (1 division).

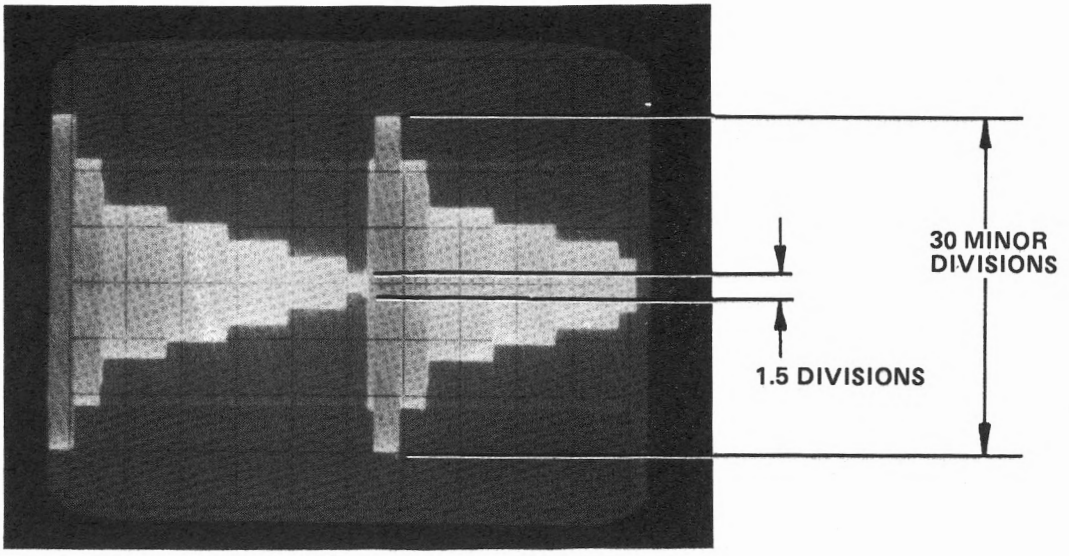


Figure 6-3. White Clip Set Oscilloscope Trace

6.5 METER MODULE ADJUSTMENTS

This section includes the test equipment and procedures to properly align the meter module. Refer to figure 6-4 for the component location of components that require adjustment.

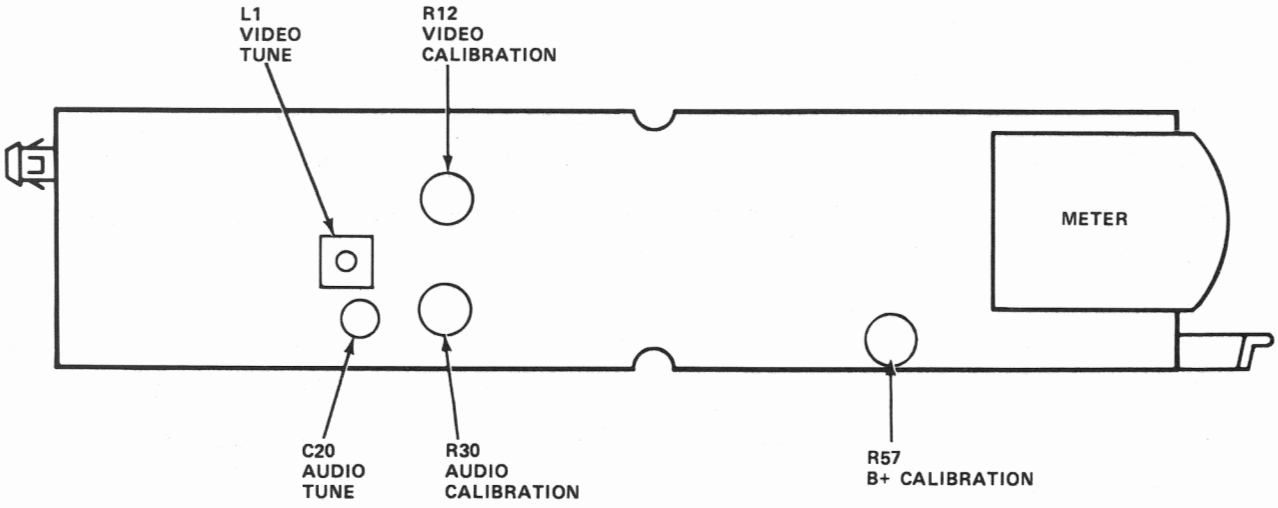


Figure 6-4. Meter Module Component Location

6.5.1 TEST EQUIPMENT REQUIRED

a. Video generator capable of generating a flat-field video signal

b. Audio oscillator capable of generating a 10.42-kHz sine wave

c. Spectrum analyzer capable of resolving 10-kHz sidebands on the audio carrier, and capable of demodulating the video signal (preferable on a linear scale)

d. 75-ohm, 18.1 dB attenuator

e. Digital voltmeter

Remove the top cover (the one farthest from the printed-wiring board), and place the meter module on an extender.

6.5.2 B+ CALIBRATION

Set the meter function switch to the B+ position. Using the digital voltmeter, be sure that B+ voltage is 20 volts (see power supply calibration, paragraph 6.3). Adjust R57 until the meter reads in the center of the green block marked "B+".

6.5.3 AUDIO CALIBRATION

Supply a 10.42-kHz sine wave to the audio input on the rear panel. Monitor the sound IF with a spectrum analyzer adjusted to resolve 10-kHz modulation sidebands. Adjust the DEVIATION control for the first null in the sound carrier component, as seen on the spectrum analyzer. Adjust C20 in the meter module for maximum deflection of the meter in the AUDIO mode. Adjust R30 until the meter reads in the center of the 25-kHz block.

6.5.4 VIDEO CALIBRATION

Supply a 100% flat-field video signal to the modulator. Adjust the modulator for 87.5% depth of modulation. One way that this can be done is described below.

Adjust the spectrum analyzer, preferably on a linear scale, to demodulate the video carrier. Insert the 18.1-dB attenuator in the input to the spectrum analyzer and note the level of the sync tips on the CRT. Remove the attenuator and adjust the video modulation until the white level is at the same place on the CRT. The depth of modulation is now 87.5%.

Adjust L1 for the maximum deflection of the meter in the VIDEO mode. Then adjust R12 until the meter reads in the center of the 87.5% green block.

6.6 AUDIO MODULATOR ADJUSTMENTS

This section includes the test equipment and procedures to properly align the audio modulator module. Refer to figure 6-5 for the component location of components that require adjustment.

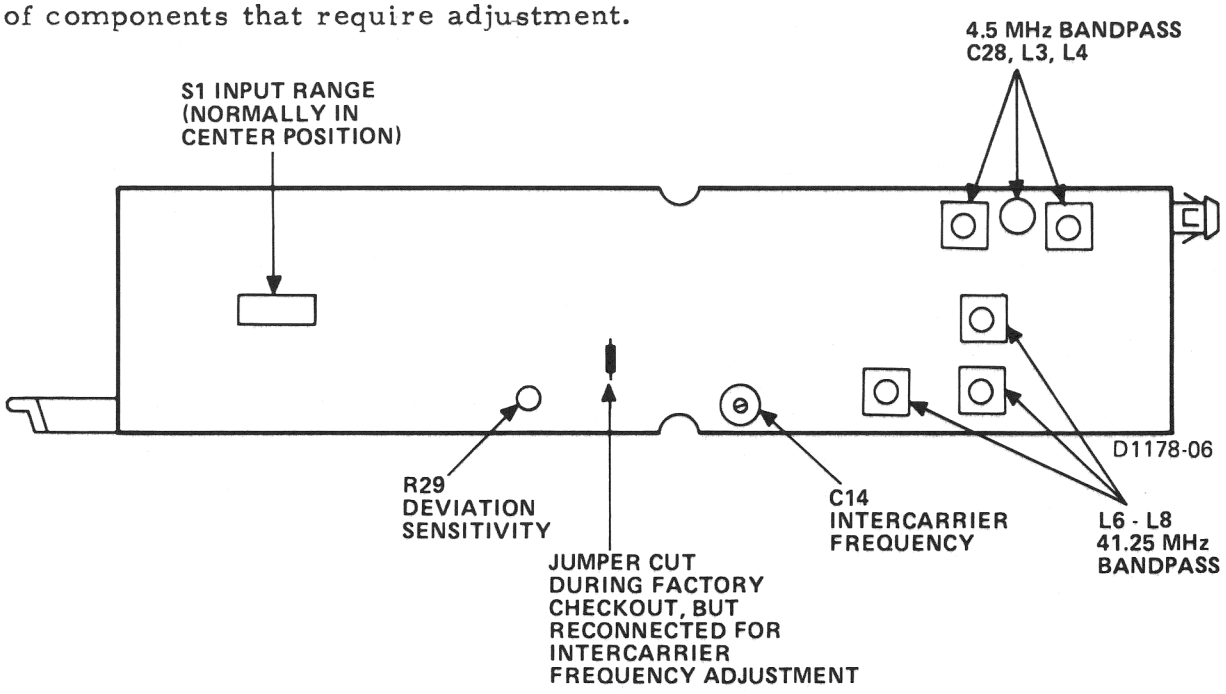


Figure 6-5. Audio Modulator Component Location

6.6.1 TEST EQUIPMENT REQUIRED

a. Frequency counter capable of measuring 41.25 MHz ±100 Hz

b. Sine wave generator capable of driving 1 milliwatt into a 600-ohm load at 10.42 kHz

c. Audio oscilloscope or audio voltmeter

d. Spectrum analyzer capable of measuring the amplitude of a 41.25-MHz signal, preferably to much better than 1-dB resolution, and capable of resolving components spaced 10 kHz apart

e. Sweep setup capable of measuring return loss less than 16.5 dB (1.35:1 VSWR) at 4.5 MHz ±100 kHz

f. Clip lead to BNC cable (75 ohms)

6.6.2 EXTERNAL SUBCARRIER INPUT

Adjust the sweep setup to measure a VSWR of 1.35:1 at 4.5 MHz ±100 kHz. Temporarily unplug the video modulator and connect a 75-ohm BNC to clip-lead cable to pin K of the printed-wiring board connector behind the audio module. Tack solder a short piece of wire to the motherboard run if necessary. Pin K is the ninth pin from the top of the connector. Place the modulator in the subcarrier mode by strapping terminal 13 of the barrier strip to ground. Adjust C28, L3, and L4 for a VSWR response as shown in figure 6-6.

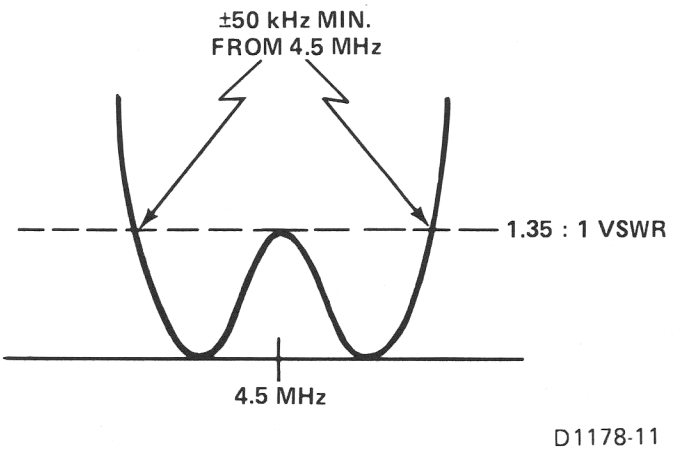


Figure 6-6. VSWR Frequency Response

Disconnect the sweep equipment, plug the video modulator back in, and remove the ground from terminal 13 of the barrier strip.

6.6.3 INTERCARRIER OSCILLATOR FREQUENCY

Temporarily re-connect a jumper near the center of the module as shown in figure 6-5. This jumper defeats the phase lock loop controlling the intercarrier oscillator frequency, permitting its frequency to be set. Be certain that the jumper doesn't short to the ground plane. Connect the frequency counter to pin C (third from the top) of the printed-wiring board connector behind the audio module, using the clip lead to BNC cable. Unplug the vestigial sideband filter module. With no audio input, adjust C14 until the frequency counter indicates a sound IF frequency 4.5 MHz

below the picture IF (nominally the frequency read should be 41.25 MHz). Set C14 to within 5 kHz of the desired frequency. Disconnect the jumper described above. The intercarrier frequency should move to within 1 kHz of the proper frequency. Restore the modulator to the normal operating configuration.

6.6.4 41.25-MHz BANDPASS FILTER

Connect the spectrum analyzer or signal level meter to the IF output on the rear panel of the modulator, and adjust it to monitor the amplitude of the 41.25-MHz sound IF. Carefully adjust inductors L6, L7, and L8 for the maximum amplitude of the sound IF.

6.6.5 DEVIATION SENSITIVITY

Connect the 10.42-kHz signal generator to the baseband audio input, and the spectrum analyzer to the IF or RF output. Adjust the spectrum analyzer to monitor the sound carrier, such that the modulation sidebands can be seen. Adjust the signal generator amplitude or the DEVIATION control until the front-panel OVERDEVIATION lamp illuminates. Then back off until it extinguishes. Adjust R29 until the carrier on the spectrum analyzer is minimized.

If a meter module is to be calibrated, it may be done at this time, as the set-up above is also used in meter calibration.

6.7 VESTIGIAL FILTER ALIGNMENT

This section includes the test equipment and procedures to properly align the vestigial filter module. Refer to figure 6-7 for the component location of components that require adjustment.

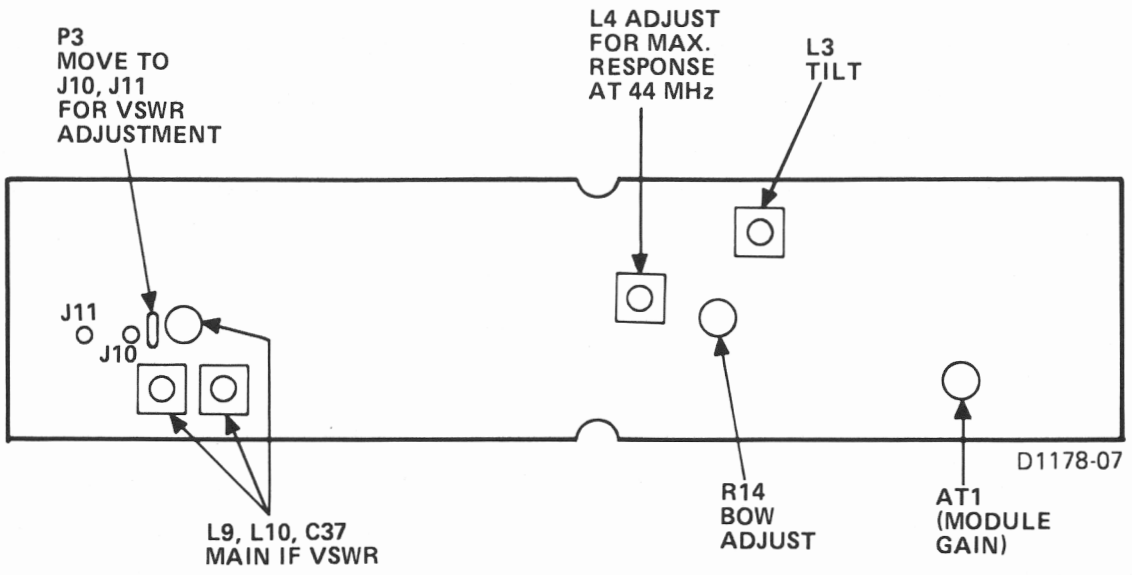


Figure 6-7. Vestigial Filter Component Location

6.7.1 TEST EQUIPMENT REQUIRED

Sweep set-up to measure 20-dB return loss (1.25:1 VSWR) and amplitude response, 40 to 50 MHz.

6.7.2 OUTPUT VSWR

Move jumper P3 to connectors J10 and J11, as shown in figure 6-7. Connect the sweep set-up, set to measure return loss, to the lowest connector behind the vestigial filter module (J3). Use a short 75-ohm cable if necessary. Adjust L9, L10, and C37 for a VSWR less than 1.25:1 from 41 to 47 MHz. Return P3 to its normal configuration.

6.7.3 CENTER FREQUENCY AMPLITUDE RESPONSE

Insert a swept frequency signal on connector J2, the center connector behind the module, and remove the signal from connector J3. Adjust inductor L4 for the maximum response at 44 MHz, without regard to the effect at other frequencies. Adjust inductor L3 and potentiometer R14 for the flatest overall response between 41 and 46 MHz, giving particular attention to the response at 45.75 and 42.17 MHz. For this test a very slow sweep speed and repetition rate (on the order of 20/second) must be used. Small fluctuations in the amplitude response are not significant.

Inductor L3 determines the overall slope of the response, and potentiometer R14 determines the degree to which the response is bowed up or down. Module gain will also be affected by the setting of potentiometer R14. Attenuator AT1 is included to permit the module gain to be set nominally to -2 dB. Normally, readjustment should not cause this gain to shift enough to require a different pad, unless the SAW filter is replaced.

6.8 OUTPUT CONVERTER LOCAL OSCILLATOR ADJUSTMENT

This section includes the test equipment and procedures to properly align the output converter local oscillator. Refer to figures 6-8 and 6-9 for the component location of components that require adjustment in the output converter local oscillator low band and high band, respectively.

6.8.1 TEST EQUIPMENT REQUIRED

a. Spectrum Analyzer

b. Frequency Counter

Remove the top cover (the one farthest from the printed-wiring board), and place the module on an extender. Remove the top rear cover from the modulator chassis. Connect the spectrum analyzer to the lowest RF connector behind the local oscillator.

6.8.2 OUTPUT CONVERTER LOCAL OSCILLATOR ADJUSTMENT

Adjust capacitor C6 (sub-low or low band) or C3 (high band) for the maximum local oscillator output. Note that as the capacitor is rotated away from the position of maximum output, the output drops more slowly for rotation in one direction than the other. Set the capacitor on the "slow" side of the peak.

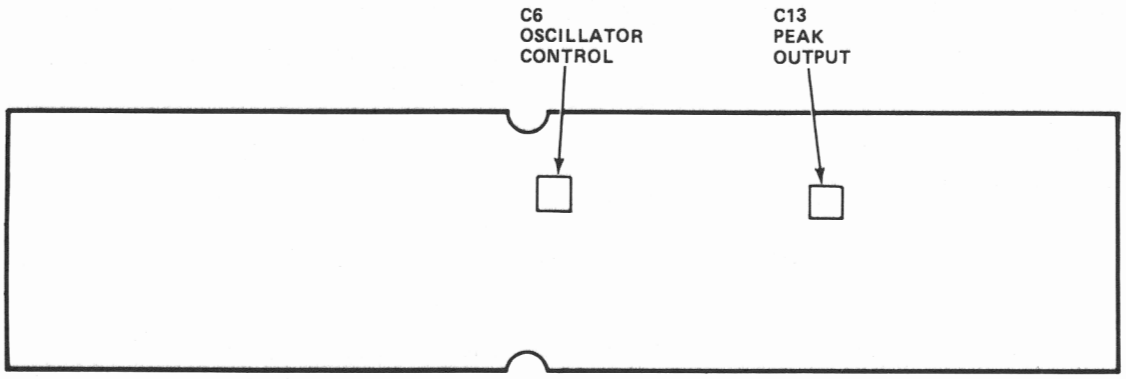


Figure 6-8. Low-Band Output Converter
Local Oscillator Component Location

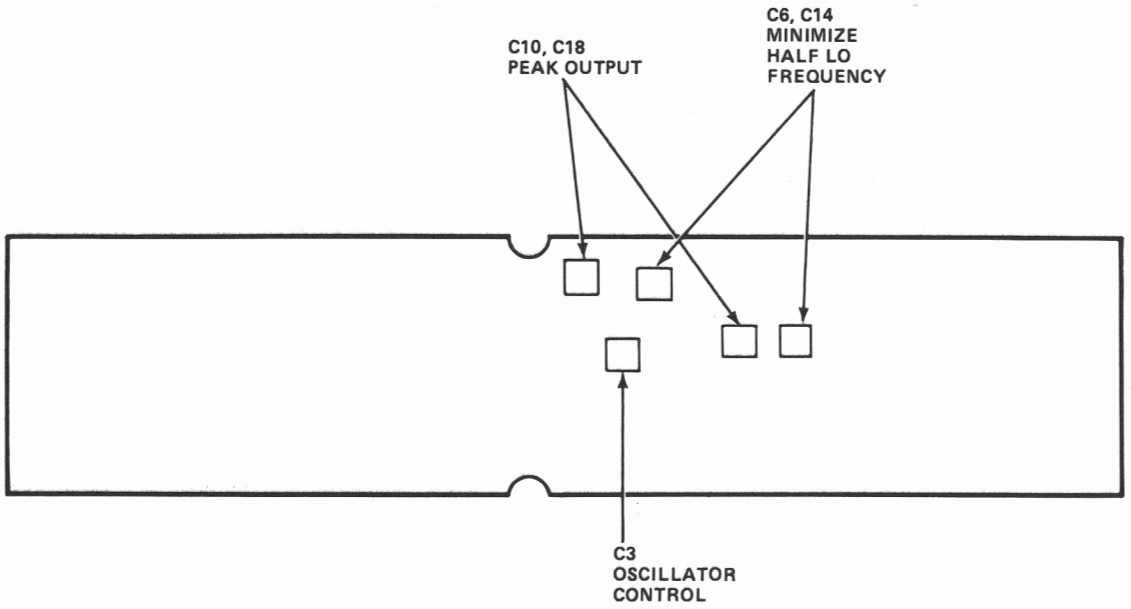


Figure 6-9. High-Band Output Converter
Local Oscillator Component Location

Adjust capacitor C13 (low band) or capacitors C10 and C18 (high band) for maximum local oscillator output. For high band, adjust capacitors C6 and C14 for minimum output at half the LO frequency. Some interaction will exist between the four adjustments.

6.9 OUTPUT CONVERTER ADJUSTMENTS

This section includes the test equipment and procedures to properly align the output converter module. Refer to figures 6-10 or 6-11 for the component location of components that require adjustment.

6.9.1 TEST EQUIPMENT REQUIRED

Sweep set-up to measure amplitude response (typically 0.25 dB) from 40 to 50 MHz.

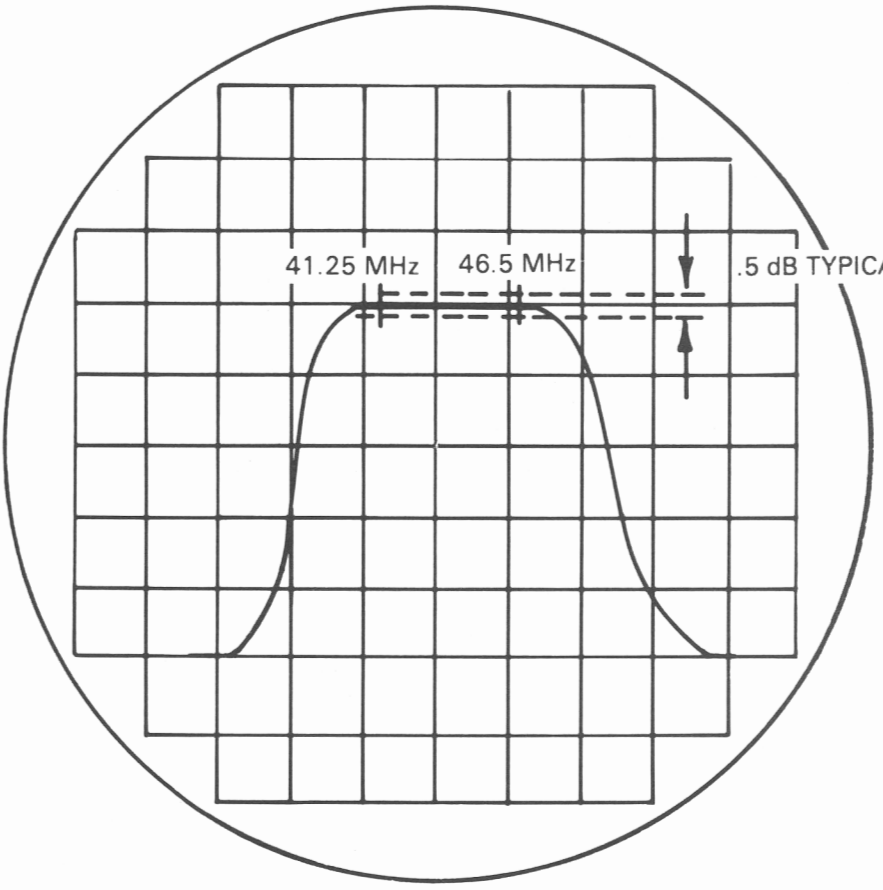
6.9.2 SUB-LOW OUTPUT CONVERTER ADJUSTMENT PROCEDURE

a. Extract the sub-low output converter module and remove the cover exposing the component side of the printed-wiring board. Install the extender module in the output converter compartment and place the output converter on the extender.

b. Remove the connector from the IF IN connector of the output converter.

c. Connect the output of the sweep generator to the IF IN connector. Connect the detector to the RF OUT connector (J1) on the rear apron of the modulator.

d. Adjust the center frequency of the sweep generator to 44 MHz. Set the oscilloscope to DC COUPLED and adjust the sensitivity for 10 mV/division. Adjust the sweep generator output level and sweep width controls to obtain a display on the graticule similar to one shown in figure 6-10.



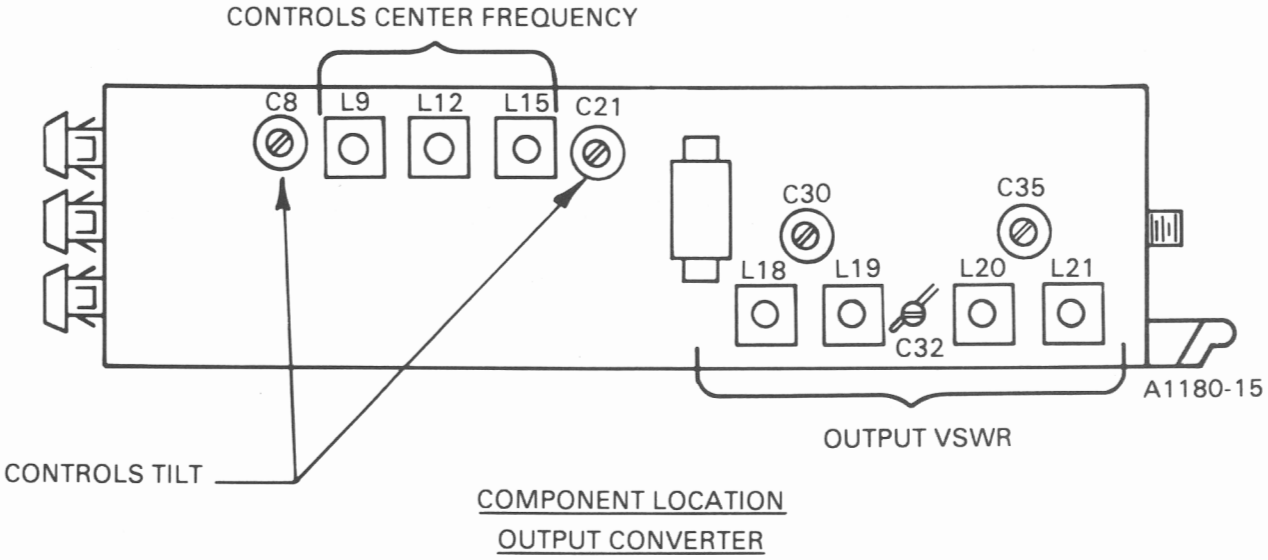


Figure 6-10. Typical Output Converter Swept Response

e. If the response is not within the limits specified, adjustment of L1, L2, L3, L5, L6, L7, and L9 should yield the desired results (see figure 6-11). Inductors L1, L2, and L3 control the knee nearest the sound carrier, while L5, L6, L7, and L9 control the knee nearest the video carrier. The two amplifier stages can be isolated by using the test connector and appropriate positioning of the jumper plug (see figure 6-11). In this manner, problems in signal flow, if any, can be located more readily. Capacitor C17 can be adjusted to improve output VSWR.

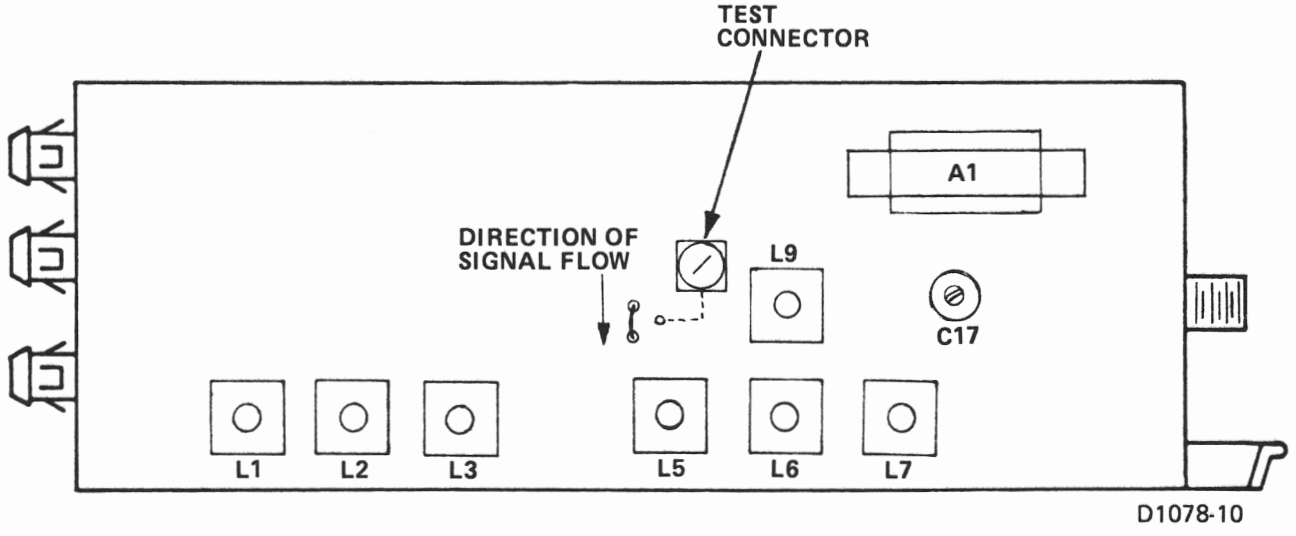


Figure 6-11. Sub-Low Output Converter Component Location

6.9.3 LOW-BAND, MID-BAND, HIGH-BAND, AND SUPER-BAND OUTPUT CONVERTER

a. Steps a through d of paragraph 6.9.2 are identical for the low-band, mid-band, high-band, and super-band output converter.

b. Adjust L9, L12, L15 and C8 and C21 until the response between 41.25 MHz and 46.5 MHz is flat within ±0.5 dB. Inductors L9, L12, and L15 determine the center frequency and capacitors C8 and C21 control the tilt.

c. The four-section output filter comprised of L18, L19, L20, L21, C30, C32, C35 also affect the overall response: however, these controls should only be adjusted while observing the output VSWR.

d. The gain at this point should be 18 dB ±1 dB.

6.9.4 HYPERBAND OUTPUT CONVERTER

6.9.4.1 Test Equipment Required

The following test equipment or equivalent, is required to complete this procedure.

HP8640B Signal Generator

Wavetek Sweep/Signal Generator Model 1801A

20-Volt Power Supply

Texscan Model RCB-75 VSWR Bridge

75-Ohm BNC Termination

1.25:1 BNC Mismatch

Step Attenuator Set

Sweep Detector

Marker Generator (two required) 290 MHz - 450 MHz

Frequency Counter

Output Converter Test Fixture

75-Ohm "F" Termination

Special Output Converter VSWR cable (14 inches, Scientific-Atlanta part number 229968, or equivalent coaxial cable with an "F" male connector on one end and a BNC male connector on the other end).

Assorted cables, adapters, alignment tools, etc.

6.9.4.2 Hyperband Output Converter Adjustment Procedure

a. Adjust sweep setup to measure a VSWR of 1.25:1 from the lower edge of the 6 MHz bandpass to 4 MHz above the upper edge of the bandpass (10 MHz wide). Refer to figure 6-12.

Example: Channel AA (IRC) bandpass is 300 MHz to 306 MHz. VSWR response for channel AA is 300 MHz to 310 MHz.

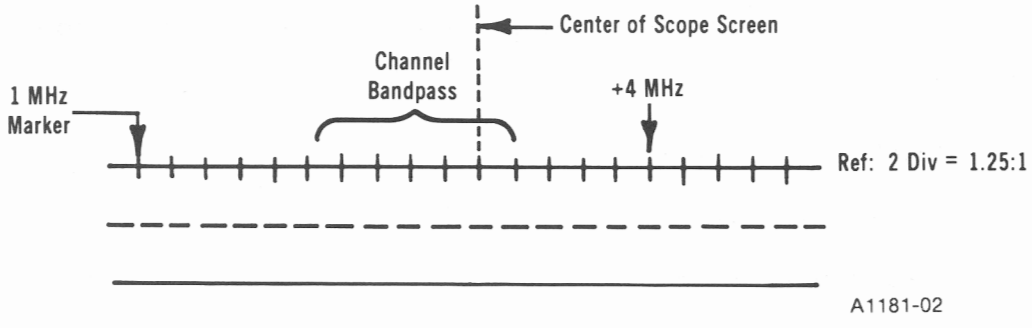


Figure 6-12. Hyperband Output Converter Initial Sweep Display Setup

b. Connect VSWR bridge to connector J5 (make sure that the "F" connectors are screwed down tightly). Connect 75-ohm termination to connector J1 (IF IN). Connect the HP8640B signal generator to connector J2 (LO IN). Set level for +7 to +10 dBm. Set frequency to LO frequency of the converter channel being tuned. Move E1 to the TEST position as shown in figure 6-13. Tune capacitors C4, C5, and C6 for a two-pole response as shown in figure 6-14. Capacitors C4 and C6 control the position of the poles; capacitor C5 is the bandwidth control.

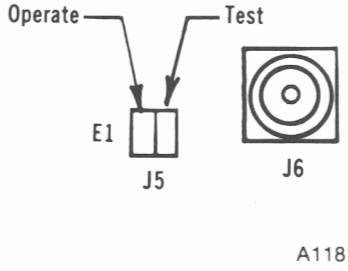


Figure 6-13. Hyperband Output Converter Connector Test Position for Tuning Filter C4-C6

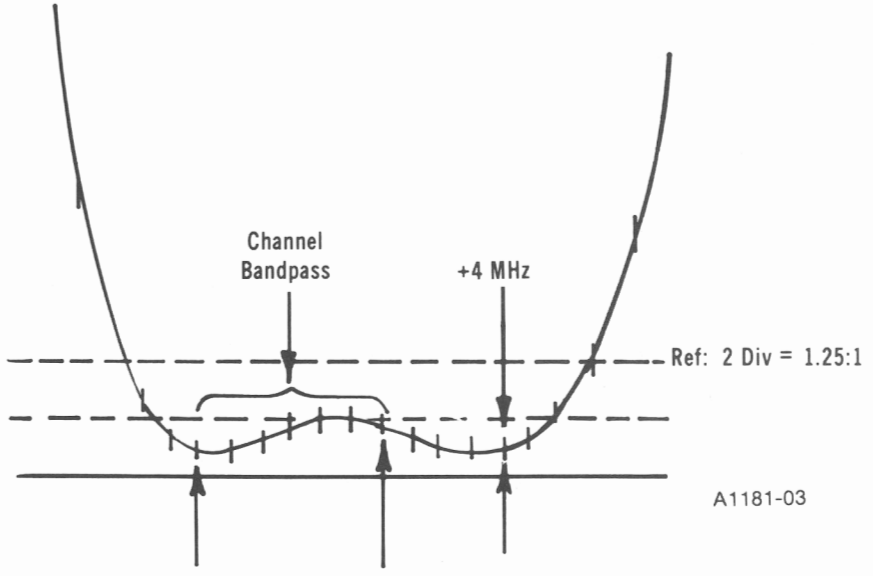


Figure 6-14. Hyperband Output Converter Frequency Response for Two-Pole Filters

CAUTION

After the filter is tuned, rocking the bandwidth control back and forth should move the upper pole back and forth. If, instead, the lower pole moves, the filter is improperly aligned and must be retuned. Decrease the capacitance of the bandwidth control and retune the poles until the desired response is obtained. This applies to all three filter sections.

c. Remove the VSWR bridge from connector J6 and connect it to connector J8. Return E1 to the OPERATE position (figure 6-13). Move E2 to the TEST position (figure 6-15).

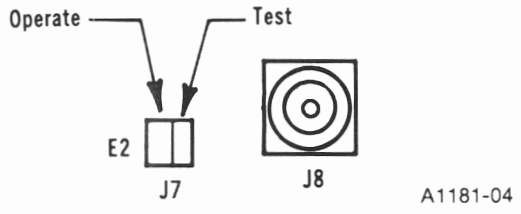


Figure 6-15. Hyperband Output Converter Connector Test Position for Tuning Filter C11 - C13

d. Tune capacitors C11, C12, and C13 to obtain the response shown in figure 6-14. Capacitor C12 is the bandwidth control. Capacitors C11 and C13 control the position of the poles.

e. Remove the VSWR bridge from connector J8 and return E2 to the OPERATE position. Connect the VSWR bridge to the BNC end of the special output VSWR cable. Connect the "F" end to connector J3 (RF OUT).

Note

If the test fixture is constructed such that there are lengths of cable inside of it, remove the converter from the test fixture; connect test cable directly to the converter through connector number C082370. Power up the converter with clip leads or PC edge connector number C082527 with power leads soldered to it. Tune capacitors C20, C21, and C22 to obtain the response shown in figure 6-14. Capacitor C21 is the bandwidth control; C20 and C22 control the position of the poles. Remove test cable and VSWR bridge. If test fixture was removed during this step, reinstall it.

f. Adjust the sweep setup to measure amplitude response between 35 MHz and 55 MHz. Connect sweep generator RF OUT to connector J1. Connect sweep generator DEMOD IN (or RF IN if internal detector is being employed) through the sweep detector to connector J3.

g. Verify output converter module gain of 18 dB ±1 dB. Change value of AT1 if necessary.

h. Verify overall flatness of 0.5 dB or less between 41 MHz and 47 MHz (refer to figure 6-16). Slightly adjust the first two filters if necessary. Capacitors C5 and C12 appear to get the best results. Do not touch the output filter adjustments.

i. Disconnect sweep input from connector J3 and connect it to connector J4. Connect a 75-ohm termination to connector J3.

j. Verify that signal level at connector J4 is down 20 dB ±1 dB with respect to connector J3.

k. This completes the adjustment procedure of the hyperband output converter.

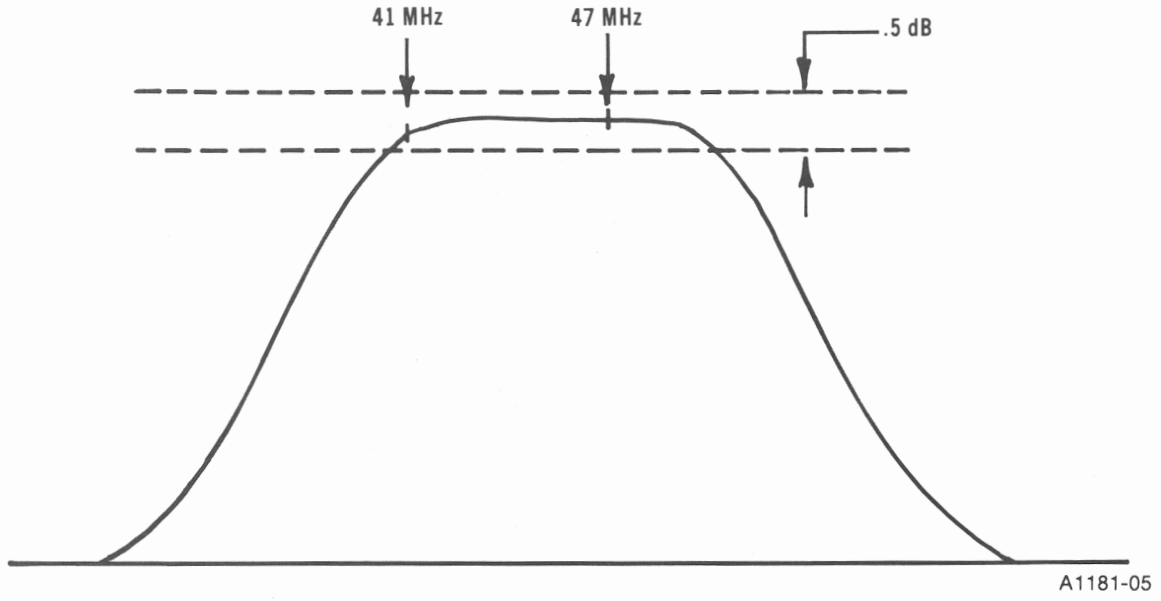


Figure 6-16. Hyperband Output Converter Amplitude Response (Flatness)

6.9.5 EXTENDED HYPERBAND OUTPUT CONVERTER

6.9.5.1 Test Equipment Required

In addition to all of the test equipment specified in paragraph 6.9.4.1 for the hyperband output converter, the following test equipment is required for the extended hyperband adjustment procedure:

1.35:1 BNC Mismatch

6.9.5.2 Extended Hyperband Output Converter Adjustment Procedure

a. Adjust sweep setup to measure a VSWR of 1.35:1. Center the display at center of the 6 MHz bandpass. Refer to figure 6-17.

Example: Channel SS (IRC) bandpass is 408 MHz to 414 MHz. The center is 411 MHz.

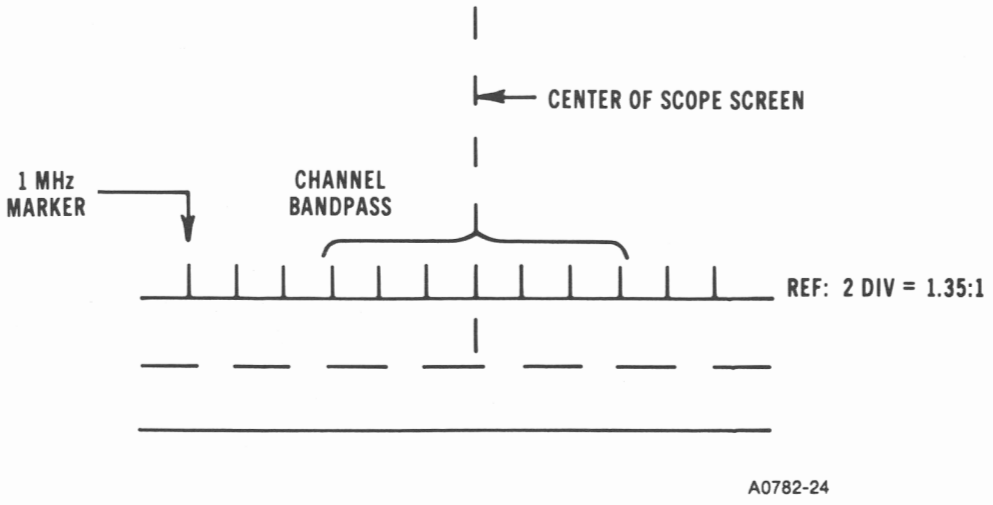


Figure 6-17. Extended Hyperband Output Converter Initial Sweep Display Setup

b. Move E2 and E3 to the test position as shown in figure 6-18. Connect VSWR bridge to TP2 (make sure that the "F" connectors are screwed down tightly). Tune capacitors C16, C17, and C19 for a two-pole response as shown in figure 6-19. Capacitors C16 and C19 control the position of the poles; capacitor C17 controls the bandwidth.

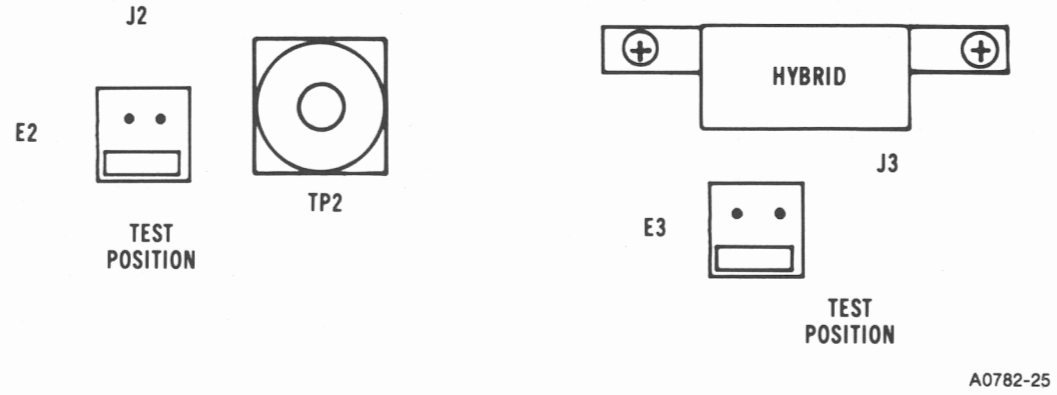


Figure 6-18. Extended Hyperband Output Converter Connector Test Position for Tuning Filter C16, C17, C19

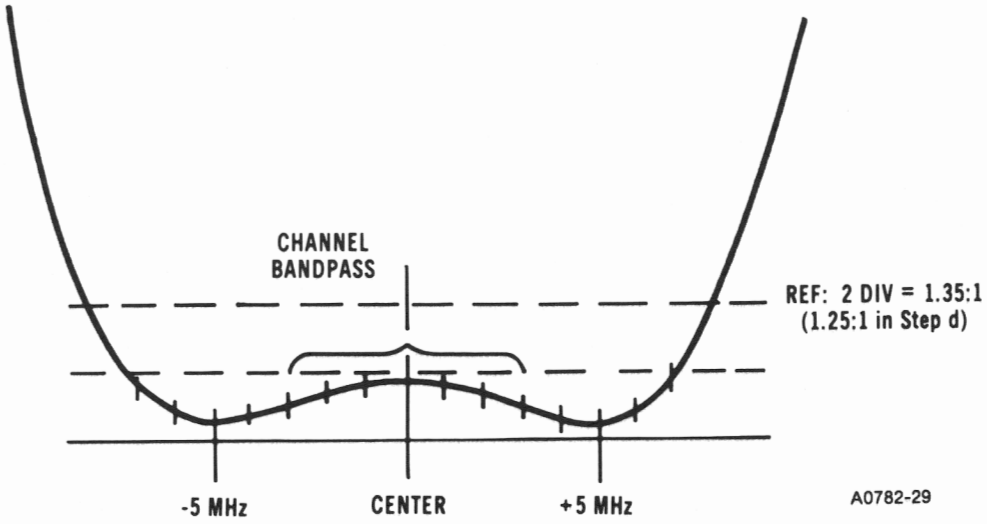


Figure 6-19. Extended Hyperband Output Converter Frequency Response for Twp-Pole Filters

CAUTION

After the filter is tuned, rocking the bandwidth control back and forth should move the upper pole back and forth. If instead, the lower pole moves, the filter is improperly aligned and must be retuned. Decrease the capacitance of the bandwidth control and retune the poles until the desired response is obtained. This also applies to the filters tuned in steps c and d of this procedure.

c. Remove the VSWR bridge from TP2 and connect it to TP1. Move E2 to the OPERATE position and move E1 to the TEST position (figure 6-20). Tune capacitors C9, C11, and C12 to obtain the response shown in figure 6-19. Capacitors C9 and C12 control the position of the poles. Capacitor C11 controls the bandwidth.

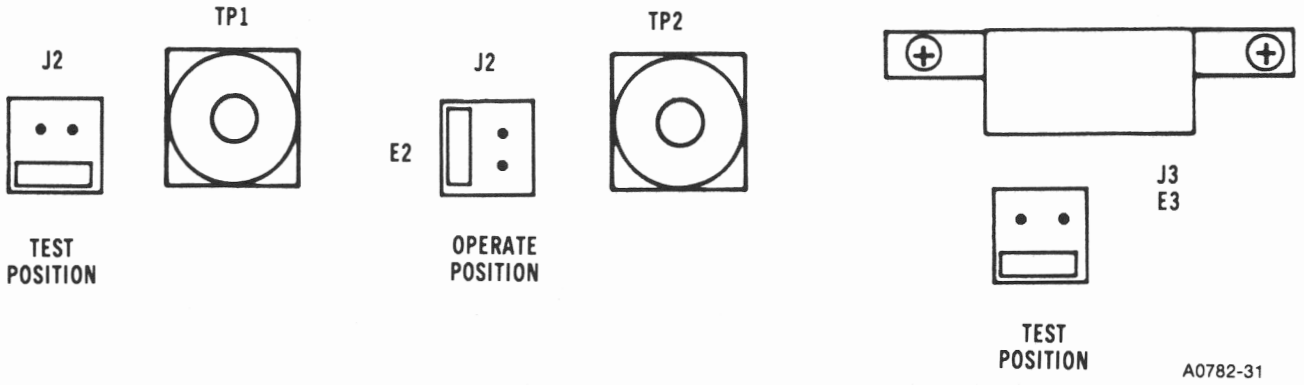


Figure 6-20. Extended Hyperband Output Converter Connector Test Position for Tuning Filter C9, C11, C12

d. Remove the VSWR bridge from TP1. Move E1 and E3 to the OPERATE position shown in figure 6-21.

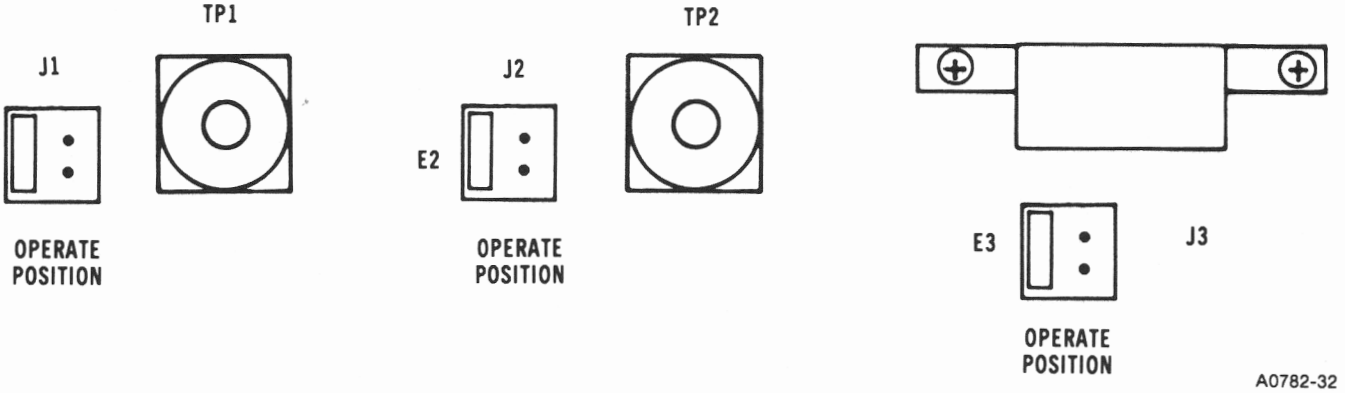


Figure 6-21. Extended Hyperband Output Converter Connector Operate Position for Tuning Filter C27, C28, C30

Adjust the sweep setup to measure a VSWR of 1.25:1. Connect the VSWR bridge to the BNC end of the special output cable. Connect the "F" end to connector J6 (RF OUT). Tune capacitors C27, C28, and C30 to obtain the response shown in figure 6-19. Capacitors C27 and C30 control the position of the poles; capacitor C28 controls the bandwidth. Note the caution note prior to step c.

Note

If a test fixture is used, the cable length from connector J6 (RF OUT) to the VSWR bridge must be the same as the special VSWR cable.

e. Connect the HP8640B signal generator to connector J5 (LO IN). Set the signal level to +10 dBm. Set frequency to LO frequency of the output converter channel being tuned.

Adjust the sweep setup to measure the amplitude response between 35 MHz and 55 MHz. Connect sweep generator RF OUT to connector J1. Connect sweep generator DEMOD IN (or RF IN if internal detector is being employed) through the sweep detector to connector J6 (RF OUT).

f. Verify module gain of 18 dB ±1 dB. Change value of AT1 if necessary.

g. Verify overall flatness of 0.5 dB or less between 41 MHz and 48.5 MHz (refer to figure 6-22). Slightly adjust capacitors C9, C10, C12, or C16 if necessary. Do not adjust capacitors C17, C19, C27, C28, and C30.

h. Disconnect sweep input from connector J6 and connect it to connector J7. Connect a 75-ohm termination to connector J6.

i. Verify that the signal level at connector J7 is down 20 dB ±1 dB with respect to connector J6.

j. This completes the adjustment procedure of the extended hyperband output converter.

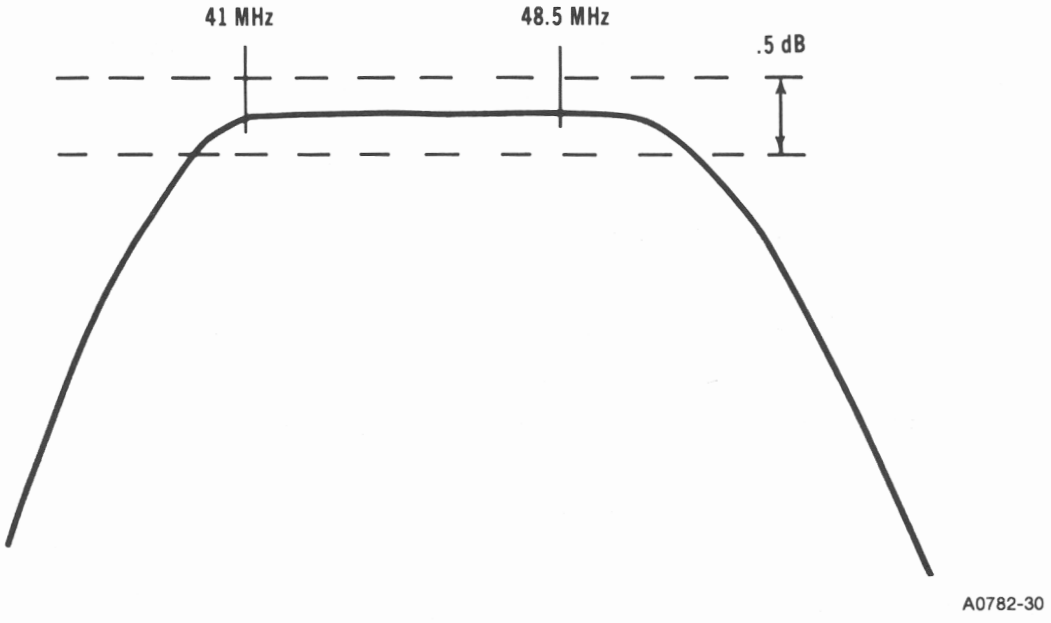


Figure 6-22. Extended Hyperband Output Converter Amplitude Response (Flatness)

6.10 PHASE LOCK ADJUSTMENTS

Refer to section 5.13 of this manual for adjustments applicable to the phase lock circuitry.

6.11 VIDEO AGC ADJUSTMENT

This section includes the test equipment and procedures to properly align the video AGC module.

6.11.1 TEST EQUIPMENT REQUIRED

Oscilloscope - dual channel

6.11.2 VIDEO AGC ADJUSTMENT PROCEDURE

Display the incoming video on channel 1. Display the 0 to 10-volt signal on the collector (case) of transistor Q17 on channel 2. Adjust potentiometer R54 until the pulse overlaps the backporch of the video signal.

6.12 AUXILIARY IF AGC MODULE ALIGNMENT

This section includes the test equipment and procedures to properly align the auxiliary IF AGC module. Refer to figure 6-23 for the component location of the components that require adjustment.

6.12.1 TEST EQUIPMENT REQUIRED

Sweep set-up with reflectometer to measure 20-dB return loss (VSWR less than 1.22:1) from 41 to 47 MHz.

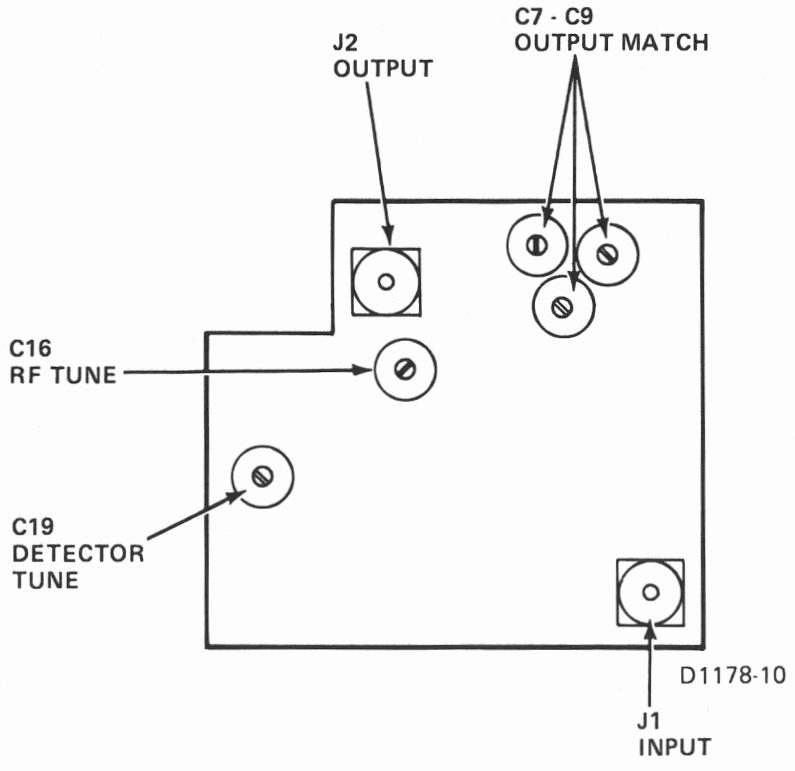


Figure 6-23. Auxiliary IF AGC Component Location

6.12.2 AUXILIARY IF AGC ALIGNMENT PROCEDURE

Module alignment consists of adjusting the filter providing a match on the RF output, tuning the IF amplifier in the AGC path, and tuning the detector.

To tune the IF output filter, terminate the input with 75 ohms. Attach a sweep setup with reflectometer to the output. Set a reference of 20-dB return loss (VSWR less than 1.22:1). Adjust capacitors C7 through C9 for a return loss greater than 20 dB from 41 to 47 MHz.

To tune the RF amplifier and detector, supply an input IF signal and adjust the output level potentiometer until AGC control is obtained. Then adjust the RF tuning capacitor C16 and detector tuning capacitor C19. These may either be adjusted for maximum voltage on the AGC TEST output, or for minimum IF output.

6.13 SPECTRUM INVERTER ALIGNMENT

This section includes the test equipment and procedures to properly align the spectrum inverter module. Refer to figure 6-24 for the component location of the components that require adjustment.

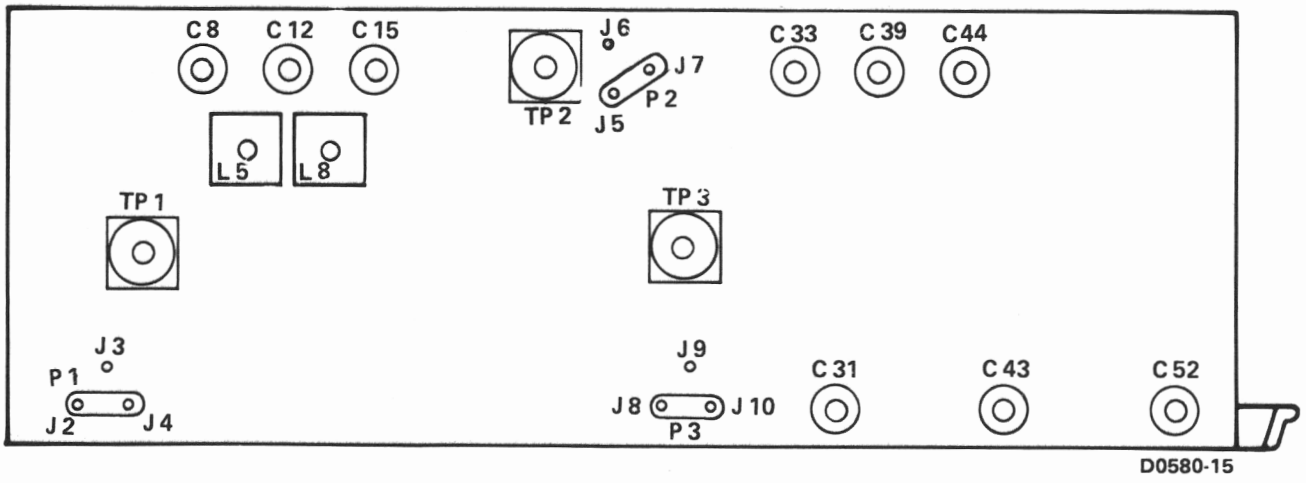


Figure 6-24. Spectrum Inverter Component Location

6.13.1 TEST EQUIPMENT REQUIRED

Sweep setup to measure amplitude response (typically 0.25 dB) from 40 to 50 MHz.

6.13.2 SPECTRUM INVERTER ADJUSTMENT PROCEDURE

a. Extract the spectrum inverter from the chassis and remove the cover, exposing the component side of the printed-wiring board. Place the spectrum inverter on a module extender.

b. Remove the main chassis IF IN and IF OUT cables and connect a sweep set-up to connectors J1 (input) and J11 (output) of the spectrum inverter.

c. Adjust the center frequency of the sweep generator to 44 MHz. Set the oscilloscope for DC and the sensitivity for 10 mV per division. Adjust the sweep generator output level and sweep width controls to obtain a sweep display similar to figure 6-25.

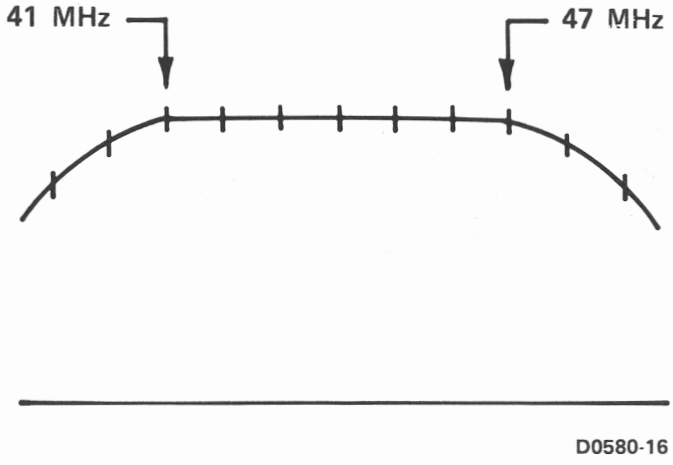


Figure 6-25. Spectrum Inverter Overall Response

d. If only a slight touch-up is needed, such as tilt, flatness, or bandwidth, adjust capacitors C33, C39, and C44. Capacitor C39 controls the bandwidth, while capacitors C33 and C44 control the center frequency and flatness.

e. If more drastic re-alignment is indicated, the sweep setup detector should be moved to test point TP2 and plug P2, positioned between connectors J5 and J6. The response shape should be similar to the overall response, but may be slightly wider. Make small touch-up adjustments to capacitors C8, C12, and C15 for proper bandpass and flatness. Inductors L5 and L8 primarily affect bandwidth and should be re-adjusted as little as possible.

f. After completing step e., the module should be swept again as outlined in step d.

g. Overall gain of the module is 0 dB ±2 dB.

h. In case of continued difficulty with response shape or gain, the local oscillator should be checked for correct level and frequency as follows:

   1. Check the 115-MHz oscillator by connecting a spectrum analyzer or signal level meter to test point TP1 (reposition plug P1 between connectors J3 and J4). The correct level is +55 to +61 dBmV and the frequency is 115 MHz ±3 kHz. If the level or frequency is incorrect, make a slight re-adjustment of capacitor C11 to peak signal and place on frequency. Replace plug P1 in the normal position (between J2 and J4).

   2. The 203-MHz oscillator is checked similarly at test point TP3 (reposition plug P3 between connectors J9 and J10). Adjust capacitor C52 to peak signal and place on frequency. Adjust capacitors C43 and C31 to peak amplitude. The correct amplitude is +55 to +61 dBmV and

correct frequency is 203 MHz ±5 kHz. Replace plug P3 in the normal position (between connectors J8 and J10).

6.14 SOLID STATE SWITCH

The solid state switch requires no adjustments.

6.15 VIDEO SWITCH

The video switch requires no adjustments.

6.16 AUDIO SWITCH

The audio switch requires no adjustments.

6.17 AUDIO MODULATION LIMITER

The audio modulation limiter requires no adjustments.

SECTION 7
PARTS LISTS

7.1 GENERAL

The parts list in this section contains a description of all electrical components. A description of mechanical parts may be obtained from the assembly drawings in section 8. Refer to Table 7-1 for a numerical listing of the parts lists, page numbers, and applicable drawings. For information on parts not listed here, consult the factory or your local Scientific-Atlanta representative.

7.2 EXPLANATION OF COLUMN HEADINGS

REF DESIG:	This is the components designation that appears on the schematic diagrams for that unit.
PART NO:	The Scientific-Atlanta part number is listed in this column.
DESCRIPTION:	A brief electrical or mechanical description is given in this column.
VENDOR:	A vendor code assigned by Scientific-Atlanta is given in this column. A cross-reference of these codes to manufacturers appears at the end of this section.
VENDOR NUMBER:	The number assigned to the part by the manufacturer is listed in this column.

7.3 ORDERING PARTS

When ordering parts from Scientific-Atlanta, always include the S-A part number, part description, unit serial number, unit name, sub-assembly name, part manufacturer, and manufacturers' part number.

TABLE 7-1. MODEL 6350 PARTS LISTS INDEX

Parts List Number	Parts List Page Number	Applicable Drawing Figure Number
36175	7-58	-
36177	7-59	8-45
36180	7-4	8-2
36182	7-5	8-3
36595	7-56	-
36597	7-57	8-43
153189	7-51	8-37
153202	7-45	8-34
153212	7-6	8-5
153222	7-11	8-7
153232	7-14	8-9
153242	7-17	8-11
156982	7-52	8-39
162606	7-50	8-36
162612	7-54	8-41
164221	7-39	8-30
164231	7-42	8-32
230250	7-87	8-56
230252	7-88	8-58
230302	7-22	8-15
230307	7-27	8-17
230314	7-24	8-17
230323	7-29	8-17
230707	7-31	8-19

TABLE 7-1. MODEL 6350 PARTS LIST INDEX - continued

Parts List Number	Parts List Page Number	Applicable Drawing Figure Number
230907	7-20	8-13
231080	7-65	8-47
231081	7-68	8-49
231082	7-71	8-49
231083	7-74	8-49
231084	7-77	8-50
231302-336	7-34	8-22
231502	7-64	8-47
231580	7-36	8-24
232180	7-37	8-25
233640	7-80	8-51
233820-821	7-81	8-53
233822-824	7-84	8-55
275137-142	7-38A	8-27
275153	7-38B	8-28

PARTS LIST
POWER SUPPLY ASSEMBLY
36180

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036183		SCHEM DIAG POWER SUPPLY		
001	0036182		ASSY, POWER SUPPLY PC		
002	0036184		POWER SUPPLY MODULE HOUSING		
003	0036240		FRONT PANEL POWER SUPPLY		
004	0036250		COVER MODULE		
005	0077322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500		MODULE HANDLE PLASTIC "T"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
009	0036198		POWER SUPPLY HEAT SINK		
010	0072321		SCREW 4-40 X 3/8 F HD,82 DEG,SST	XZ	PER MS51959-15
011	0072327		SCREW 4-40 X 3/8 PAN HD,SST	XZ	PER MS51957-15
012	0077871		CLIP DATALAMP CARTRIDGE MTG	DI	515-0051
013	0085862		INSULATOR MICA RECT MOS CASE 199	MOS	M05608A002
014	0085859		WASHER COMPRESSION #4 SCREW CASE 199+220	MOS	B52200F005
015	0073268		WASHER NO. 6 LOCK, SPLIT, CAD PLT STL	XZ	ANSI B18.21.1
DS001	0082384		LAMP LED YEL CRTDG W/YEL LENS 5V 20MA	DI	507-4757-3333-500
F 001	0071223		FUSE 2 AMP	L	3AG 312002.
Q 001	0035671		TRANSSTR MJE3055 SIL NPN	MOS	MJE3055
TP001	0082526		JACK TEST RED	J	105-1042-001
TP002	0082525		JACK TEST BLACK	J	105-1043-001

PARTS LIST
POWER SUPPLY PW BOARD ASSEMBLY
36182

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036182PPC		PREFORM FOR 6150 POWER SUPPLY		
	0036182WPC		WIRE PREP FOR 6150 POWER SUPPLY		
001	0036181		PC BD POWER SUPPLY		
002	0081453		FUS HLDR CLIP FOR 3AG OR 3AB PC MT 2 PIN	ZIE	798
009	0229987		ASSY POWER SUPPLY AUTO-INSERTION		
C 002	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 003	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 005	0070671		CAPACITR 100 MF 25V	SP	500D107G025DD7
C 01A	0082505		CAPACITR 1600 MF 40V	SP	39D168G040JL4
C 01B	0082505		CAPACITR 1600 MF 40V	SP	39D168G040JL4
CR001	0082208		DIODE MR504 SIL 400V 3A	MOS	MR504
CR002	0082208		DIODE MR504 SIL 400V 3A	MOS	MR504
CR003	0081636		RECTIFIR SCR 200PRV 8A RMS	GE	C122B
CR004	0076706		DIODE 1N4749A SI ZEN 24V 5% 1W	MOS	1N4749A
R 001	0071868		RESISTOR 50 OHM 5W WW 5%	TO	VAL5
R 002	0071822		RESISTOR 3 OHM 3W WW 5%	TO	VAL3
R 003	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 004	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 005	0089042		RESISTOR 56 OHM 1/4W 5% CARBON FILM		
R 006	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 007	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 008	0071816		RESISTOR 1 OHM 5W WW 5%	TO	VAL5
R 009	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 010	0082120		RESISTOR 6.81K OHM RN60C 1% MTL FLM	DP	RN60C6811F
R 011	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M
R 012	0082113		RESISTOR 3.65K OHM RN60C 1% MTL FLM	DP	RN60C3651F
R 013	0071954		RESISTOR 1.0K OHM 1/2W 10% COMP	AB	RCR20G102KS
U 001	0081722		IC VLTG RGLTR +OR- 2 TO 37V 14 PIN DIP	FSC	723 DC

PARTS LIST
VIDEO MODULATOR PW BOARD ASSEMBLY
153212

REF DESTG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0153212WPC		WIRE PREP FOR VIDEO MOD 6350		
001	0153211		PWB VIDEO MODULATOR		
002	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
C 001	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 002	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 003	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 004	0078600		NOT ASSIGNED		
C 005	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 006	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 007	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 008	0081113		CAPACITR 468 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 468 PF
C 009	0081118		CAPACITR .00598 MF 100V SILVER MICA 5%	SGC	D191CXXXJ03 5980 PF
C 010	0081113		CAPACITR 468 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 468 PF
C 011	0081117		CAPACITR .0023 MF 100V SILVER MICA 5%	SGC	D191C232J03
C 012	0081115		CAPACITR 935 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 935 PF
C 013	0081117		CAPACITR .0023 MF 100V SILVER MICA 5%	SGC	D191C232J03
C 014	0081115		CAPACITR 935 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 935 PF
C 015	0081114		CAPACITR 831 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 831 PF
C 016	0081116		CAPACITR .001709 MF 100V SILVER MICA 5%	SGC	D191CXXXJ03 1709 PF
C 017	0081114		CAPACITR 831 PF 100V SILVER MICA 5%	SGC	D151CXXXJ03 831 PF
C 018	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 019	0081331		CAPACITR .010435 MF 500V SILVER MICA 5%	SGC	D305CXXXJ03 10435 PF
C 020	0170669		CAPACITR 15-60 PF MIN CER DISC PC MT	ER	538-037-F 15-60
C 021	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 022	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 024	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 025	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 026	0081825		CAPACITR 87 PF 100V SILVER MICA 2%	SGC	D151C870G03
C 027	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 028	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 029	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 030	0078600		NOT ASSIGNED		
C 031	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 032	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 033	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 034	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 035	0080148		CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 036	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 037	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 038	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 039	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 040	0077514		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD10ED430J03
C 041	0078600		NOT ASSIGNED		
C 042	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 043	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 044	0077514		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD10ED430J03
C 045	0080148		CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 046	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 047	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03

PARTS LIST
VIDEO MODULATOR PW BOARD ASSEMBLY - continued
153212

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 048	0080148		CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 049	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 050	0035760		CAPACITR 4,0 PF 500V CER DISC COH +-,25P	TPT	831-COHO-409C
C 051	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 052	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 053	0035653		CAPACITR 1,0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 054	0080148		CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 055	0078600		NOT ASSIGNED		
C 056	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 057	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 059	0081825		CAPACITR 87 PF 100V SILVER MICA 2%	SGC	D151C870G03
C 060	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 061	0170667		CAPACITR 5,5-18 PF MIN CER DISC PC MT	ER	538-037-A 5,5-18
C 062	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 064	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 065	0080148		CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 066	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 067	0035761		CAPACITR 5,0 PF 500V CER DISC COH +-,25P	TPT	831-COHO-509C
CR001	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR002	0080004		DIODE 5082-2805 DET UHF SCHOTTKY QUAD	HP	5082-2805
CR003	0079919		DIODE 1N942 TC REF 11,7V ,005% ,5W	MOS	1N942
CR004	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081718		CORE BEAD FERRITE 7D ,138X,037X,150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D ,138X,037X,150L GRN	STK	57-1413
L 001	0079317		INDUCTOR 27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0081094		INDUCTOR 5,6 UH MUTUAL L1 & L2 EA 11 UH	CCT	R4259
L 003	0081093		INDUCTOR ,60 UH MUTUAL L1 & L2 EA 5,7 UH	CCT	R4260
L 004	0081122		INDUCTOR 5,82 UH 1%	AIS	10168-27
L 005	0081120		INDUCTOR 2,63 UH 1%	AIS	10152-58
L 006	0081121		INDUCTOR 4,68 UH 1%	AIS	10152-59
L 007	0081119		INDUCTOR 2,29 UH 1%	AIS	10152-57
L 008	0079330		INDUCTOR ,22 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0082599		INDUCTOR 56 UH SUBMIN UNSHLD 10%	DP	IR-2
L 010	0080137		INDUCTOR 7,1-12,5 UH PHENOLIC PC MOUNT	M	23A105RPC
L 011	0079317		INDUCTOR 27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0079141		INDUCTOR 1,8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 013	0077954		INDUCTOR ,47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 014	0078600		NOT ASSIGNED		
L 015	0078600		NOT ASSIGNED		
L 016	0078600		NOT ASSIGNED		
L 017	0079330		INDUCTOR ,22 UH SUBMIN UNSHLD 10%	DP	IR-2
L 018	0082595		INDUCTOR 12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 019	0078046		INDUCTOR 3,3 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
VIDEO MODULATOR PW BOARD ASSEMBLY - continued
153212

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 020	0079167		INDUCTOR .33 UH SUBMIN UNSHLD 10%	DP	IR-2
L 021	0079167		INDUCTOR .33 UH SUBMIN UNSHLD 10%	DP	IR-2
L 022	0073052		INDUCTOR 4.7 UH SUBMIN UNSHLD 10%	M	70F476A1
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 007	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 010	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 011	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 012	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 013	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 014	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 015	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 016	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 017	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 018	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 019	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 020	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 021	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 022	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
R 001	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 002	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 003	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 004	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 005	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 006	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 007	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 008	0078600		NOT ASSIGNED		
R 009	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 010	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 011	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 012	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 013	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 014	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 015	0089012		RESISTOR 3.3 OHM 1/4W 5% NICKEL FILM		
R 016	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 017	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 018	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 019	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 020	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 021	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO MODULATOR PW BOARD ASSEMBLY - continued
153212

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 022	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 023	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 024	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 026	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 027	0089082		RESISTOR 2,7K OHM 1/4W 5% CARBON FILM		
R 028	0089080		RESISTOR 2,2K OHM 1/4W 5% CARBON FILM		
R 029	0078600		NOT ASSIGNED		
R 030	0078600		NOT ASSIGNED		
R 031	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 032	0080136		POT 100 OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR100
R 033	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 034	0089082		RESISTOR 2,7K OHM 1/4W 5% CARBON FILM		
R 035	0089076		RESISTOR 1,5K OHM 1/4W 5% CARBON FILM		
R 036	0078600		NOT ASSIGNED		
R 037	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 038	0089080		RESISTOR 2,2K OHM 1/4W 5% CARBON FILM		
R 039	0078600		NOT ASSIGNED		
R 040	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 041	0078600		NOT ASSIGNED		
R 042	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 043	0089082		RESISTOR 2,7K OHM 1/4W 5% CARBON FILM		
R 044	0071954		RESISTOR 1,0K OHM 1/2W 10% COMP	AB	RCR20G102KS
R 045	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 046	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 047	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 048	0089128		RESISTOR 220K OHM 1/4W 5% CARBON FILM		
R 049	0089086		RESISTOR 3,9K OHM 1/4W 5% CARBON FILM		
R 050	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 051	0089076		RESISTOR 1,5K OHM 1/4W 5% CARBON FILM		
R 052	0089054		RESISTOR 180 OHM 1/4W 5% CARBON FILM		
R 053	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 054	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 055	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 056	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 057	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 058	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 059	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 060	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 061	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 062	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 063	0078600		NOT ASSIGNED		
R 064	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 065	0089076		RESISTOR 1,5K OHM 1/4W 5% CARBON FILM		
R 066	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 067	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 068	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 069	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		
R 070	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO MODULATOR PW BOARD ASSEMBLY - continued
153212

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 071	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 072	0078600		NOT ASSIGNED		
R 073	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 074	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 075	0089126		RESISTOR 180K OHM 1/4W 5% CARBON FILM		
R 076	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 077	0078600		NOT ASSIGNED		
R 078	0089086		RESISTOR 3,9K OHM 1/4W 5% CARBON FILM		
R 079	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 080	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 081	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 082	0089074		RESISTOR 1,2K OHM 1/4W 5% CARBON FILM		
R 083	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 084	0089067		RESISTOR 620 OHM 1/4W 5% CARBON FILM		
R 085	0086332		POT 10K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR10K
R 086	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 087	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 088	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 089	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 090	0078600		NOT ASSIGNED		
R 091	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 092	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 093	0071932		RESISTOR 560 OHM 1/2W 10% COMP	AB	RCR20G561KS
R 094	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 095	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 096	0082389		POT 5K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR5K
R 097	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 098	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 099	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 100	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 101	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 102	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 103	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 104	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 105	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 106	0078600		NOT ASSIGNED		
R 107	0089012		RESISTOR 3,3 OHM 1/4W 5% NICKEL FILM		
R 108	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 109	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
R 110	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
R 111	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
R 112	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
R 113	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
R 114	0089010		RESISTOR 2,7 OHM 1/4W 5% NICKEL FILM		
S 001	0084107		SWITCH TOG DPDT MIN SHORT HANDLE PC MT	CK	7201MCBE
T 001	0123031		TOROID 5 TURN NO,30 2 TURN NO,30		
T 002	0153198		TRANSFORMER,2T 6T		
U 001	0084890		IC OP AMP 8L-DIP 70C COMP 741C	MOS	MC1741CP1
U 002	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A
W 012	0073318		WIRE 22 BUS	BM	8021
W 013	0073318		WIRE 22 BUS	BM	8021
Y 001	0082521		CRYSTAL 45,75 MHZ ,0025% SERIES RES	SEN	HC-18/U HOLDER

PARTS LIST
METER MODULE PW BOARD ASSEMBLY
153222

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0153222PPC		PREFORM FOR METER MODULE 6350		
	0153222WPC		WIRE PREP FOR METER MODULE 6350		
001	0153221		PWB METER		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 006	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 008	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 009	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 010	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 011	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 012	0081109		CAPACITR 47 MF 20V SOLID TANT POL 10%	KEM	T362C476K020AS
C 013	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 014	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 015	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 016	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 017	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 018	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	TPT	831-COJO-309C
C 019	0070518		CAPACITR 100 PF 1KV CER DISC S3N 10%	CRL	DD-101
C 020	0170668		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-037-D 9-35
C 021	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 022	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 023	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 024	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 025	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 026	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 027	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 028	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 029	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 030	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 031	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 032	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 033	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 034	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 035	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 036	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 037	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 038	0081928		CAPACITR 12 PF 500V CER DISC COG 5%	TPT	831-COGO-120J
CR001	0071117		DIODE 1N756A SI ZEN 8.2V 5% .4W	MOS	1N756A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0071110		DIODE 1N277 GER 100V 75MA	SY	1N277
CR004	0071110		DIODE 1N277 GER 100V 75MA	SY	1N277
CR005	0071110		DIODE 1N277 GER 100V 75MA	SY	1N277
CR006	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR008	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154

PARTS LIST
METER MODULE PW BOARD ASSEMBLY - continued
153222

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
CR009	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR010	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR011	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR012	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR013	0071143		DIODE 1N4735A SI ZEN 6,2V 5% 1W	MOS	1N4735A
CR014	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
L 001	0082360		INDUCTOR 9,5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 002	0079317		INDUCTOR 27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 006	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
R 001	0089020		RESISTOR 6,8 OHM 1/4W 5% NICKEL FILM		
R 002	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 003	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 004	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 005	0089086		RESISTOR 3,9K OHM 1/4W 5% CARBON FILM		
R 006	0072002		RESISTOR 4,7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 007	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 008	0089072		RESISTOR 1,0K OHM 1/4W 5% CARBON FILM		
R 009	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 010	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 011	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 012	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M
R 013	0071993		RESISTOR 3,9K OHM 1/4W 10% COMP	AB	RCR07G392KS
R 014	0089094		RESISTOR 8,2K OHM 1/4W 5% CARBON FILM		
R 015	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 016	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 017	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 018	0072207		RESISTOR 2,2 MEG 1/4W 10% COMP	AB	RCR07G225KS
R 019	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 020	0071887		RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
R 021	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 023	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 024	0073038		THERMSTR 1K OHM	VEC	31D10
R 025	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		

PARTS LIST
METER MODULE PW BOARD ASSEMBLY - continued
153222

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 026	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 027	0089102		RESISTOR 18K OHM 1/4W 5% CARBON FILM		
R 028	0071914		RESISTOR 270 OHM 1/2W 10% COMP	AB	RCR20G271KS
R 029	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 030	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M
R 031	0089078		RESISTOR 1,8K OHM 1/4W 5% CARBON FILM		
R 032	0083903		RESISTOR 3,32K OHM RN55C 1% MTL FLM	DP	RN55C3321F
R 033	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 034	0089128		RESISTOR 220K OHM 1/4W 5% CARBON FILM		
R 035	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 036	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 037	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 038	0089080		RESISTOR 2,2K OHM 1/4W 5% CARBON FILM		
R 039	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 040	0072189		RESISTOR 1,0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 041	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 042	0083928		RESISTOR 28,7K OHM RN55C 1% MTL FLM	DP	RN55C2872F
R 043	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 044	0083916		RESISTOR 10,5K OHM RN55C 1% MTL FLM	DP	RN55C1052F
R 045	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 046	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 047	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 048	0083934		RESISTOR 42,2K OHM RN55C 1% MTL FLM	DP	RN55C4222F
R 049	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 050	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 051	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 052	0078933		RESISTOR 10,0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 053	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 054	0083905		RESISTOR 3,65K OHM RN55C 1% MTL FLM	DP	RN55C3651F
R 055	0084058		RESISTOR 3,57K OHM RN55C 1% MTL FLM	DP	RN55C3571F
R 056	0073038		THERMSTR 1K OHM	VEC	31D10
R 057	0080370		POT 250 OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV2511
R 058	0083833		RESISTOR 21,5 OHM RN55D 1% MTL FLM	DP	RN55D21R5F
R 059	0078933		RESISTOR 10,0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 060	0078933		RESISTOR 10,0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 061	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 062	0089088		RESISTOR 4,7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
U 001	0082382		IC AMPL CASCODE RF/IF DIFF IN 10L-TO100	MOS	MC1550G
U 002	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P
U 003	0084009		IC AMPL IF/QUAD DET 14L-DIP	MOS	MC1357P
U 004	0084011		IC AMPL-SWITCH PROGRAMMABLE 8L-DIP	RCA	CA3094E
U 005	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N
U 006	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N

PARTS LIST
AUDIO MODULATOR PW BOARD ASSEMBLY
153232

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0153232WPC		WIRE PREP FOR AUDIO MOD 6350 PCB		
001	0153231		PWB AUDIO MODULATOR		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
004	0082827		SOCKET PIN ,060-,062 CLOSED BOTTOM	CTC	450-3326-01-06-00
012	0078139		TUBING TEFLON AWG22 NATURL ,027ID ,047OD	SH	7702-22-115
013	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
C 001	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 002	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 003	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 004	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 005	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 006	0070559		CAPACITR ,0051 MF 300V SILVER MICA 1%	CD	CD19FD512F03
C 007	0035761		CAPACITR 5,0 PF 500V CER DISC COH +-,25P	TPT	831-COH0-509C
C 008	0076697		CAPACITR 2,2 MF 20V SOLID TANT POL 10%	SP	150D225X9020A2
C 009	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 010	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 011	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 012	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 014	0170667		CAPACITR 5,5-18 PF MIN CER DISC PC MT	ER	538-037-A 5,5-18
C 015	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 016	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0075417		CAPACITR ,01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 018	0070490		CAPACITR 30 PF 500V SILVER MICA 5%	CD	CD15ED300J03
C 019	0073496		CAPACITR 56 PF 500V SILVER MICA 5%	CD	CD15ED560J03
C 020	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 021	0070519		CAPACITR 120 PF 500V SILVER MICA 5%	CD	CD15FD121J03
C 022	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 023	0081098		CAPACITR ,47 MF 50V CER MONO 20%	ER	8131-050-651-474M
C 024	0081109		CAPACITR 47 MF 20V SOLID TANT POL 10%	KEM	T362C476K020AS
C 025	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 026	0077901		CAPACITR ,0015 MF 500V SILVER MICA 5%	CD	CD19FD152J03
C 027	0075197		CAPACITR ,0039 MF 500V SILVER MICA 5%	CD	CD19FD392J03
C 028	0170669		CAPACITR 15-60 PF MIN CER DISC PC MT	ER	538-037-F 15-60
C 029	0081117		CAPACITR ,0023 MF 100V SILVER MICA 5%	SGC	D191C232J03
C 030	0075196		CAPACITR ,0018 MF 500V SILVER MICA 5%	CD	CD19FD182J03
C 031	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 032	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 033	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 034	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 035	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 036	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 037	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 038	0073497		CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 039	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 040	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 041	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 042	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 043	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 044	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 045	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 046	0081210		CAPACITR ,01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 047	0070519		CAPACITR 120 PF 500V SILVER MICA 5%	CD	CD15FD121J03
C 048	0073497		CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 049	0077498		CAPACITR 1,2 PF 500V CER TUBULAR	A	CC20CK1R2C
C 050	0077498		CAPACITR 1,2 PF 500V CER TUBULAR	A	CC20CK1R2C
C 051	0079110		CAPACITR 110 PF 500V SILVER MICA 5%	CD	CD15FD111J03
C 052	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 053	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 054	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 055	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 056	0081995		CAPACITR ,001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 057	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 058	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 059	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 060	0080139		CAPACITR ,1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 061	0070519		CAPACITR 120 PF 500V SILVER MICA 5%	CD	CD15FD121J03
C 062	0070490		CAPACITR 30 PF 500V SILVER MICA 5%	CD	CD15ED300J03
C 063	0073496		CAPACITR 56 PF 500V SILVER MICA 5%	CD	CD15ED560J03

PARTS LIST
AUDIO MODULATOR PW BOARD ASSEMBLY - continued
153232

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
CR012	0077811		DIODE 1N4743A SI ZEN 13V 5% 1W	MOS	1N4743A
CR013	0076448		DIODE 1N4742A SI ZEN 12V 5% 1W	MOS	1N4742
CR014	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR015	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR016	0078714		DIODE 1N4744A SI ZEN 15V 5% 1W	MOS	1N4744A
CR017	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
J 001	0086334		SOCKET 6 PIN SINGLE IN LINE PC MT	AMP	1-583773-3
J 002	0170685		JUMPER INSULATED BODY .100 IN. LONG T&R	TEV	WL 20
J 003	0170685		JUMPER INSULATED BODY .100 IN. LONG T&R	TEV	WL 20
L 001	0082598		INDUCTOR 39 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0078975		INDUCTOR 15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0082456		INDUCTOR 23.5T #22 ST MP1 2 10-32X3/8 J	XZ	BY DESCRIPTION
L 004	0082456		INDUCTOR 23.5T #22 ST MP1 2 10-32X3/8 J	XZ	BY DESCRIPTION
L 005	0082595		INDUCTOR 12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0082357		INDUCTOR 4.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 007	0082358		INDUCTOR 6.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 008	0082357		INDUCTOR 4.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 009	0078038		INDUCTOR 2.2 UH SUBMIN UNSHLD 10%	DP	IR-2
L 010	0082345		INDUCTOR .82 UH SUBMIN UNSHLD 10%	DP	IR-2
L 011	0082345		INDUCTOR .82 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 004	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 005	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0079124		RESISTOR 309 OHM RN55C 1% MTL FLM	DP	RN55C3090F
R 002	0079124		RESISTOR 309 OHM RN55C 1% MTL FLM	DP	RN55C3090F
R 003	0083925		RESISTOR 22.6K OHM RN55C 1% MTL FLM	DP	RN55C2262F
R 004	0083925		RESISTOR 22.6K OHM RN55C 1% MTL FLM	DP	RN55C2262F
R 005	0078931		RESISTOR 4.99K OHM RN55C 1% MTL FLM	DP	RN55C4991F
R 006	0078931		RESISTOR 4.99K OHM RN55C 1% MTL FLM	DP	RN55C4991F
R 007	0083925		RESISTOR 22.6K OHM RN55C 1% MTL FLM	DP	RN55C2262F
R 008	0083925		RESISTOR 22.6K OHM RN55C 1% MTL FLM	DP	RN55C2262F
R 010	0071951		RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 011	0072034		RESISTOR 12K OHM 1/4W 10% COMP	AB	RCR07G123KS
R 012	0071920		RESISTOR 390 OHM 1/4W 10% COMP	AB	RCR07G391KS
R 013	0080197		RESISTOR 14.7K OHM RN55C 1% MTL FLM	DP	RN55C1472F
R 014	0078600		NOT ASSIGNED		
R 015	0072113		RESISTOR 100K OHM 1/4W 10% COMP	AB	RCR07G104KS
R 016	0071862		RESISTOR 47 OHM 1/4W 10% COMP	AB	RCR07G470KS
R 017	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 018	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
C 064	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 065	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 066	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 067	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 068	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 069	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 070	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 071	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 072	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 073	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 074	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 075	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 076	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 077	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 078	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 079	0076697		CAPACITR 2.2 MF 20V SOLID TANT POL 10%	SP	150D225X9020A2
C 080	0070509		CAPACITR 68 PF 500V SILVER MICA 5%	CD	CD15ED680J03
C 081	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 082	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 083	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 084	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 085	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
CR001	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR007	0078696		DIODE 1N746A SI ZEN 3.3V 5% .4W	TI	1N746A
CR008	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR009	0085003		DIODE MV209 VARACTOR SIL RADIAL LEADS	MOS	MV209
CR010	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR011	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154

PARTS LIST
AUDIO MODULATOR PW BOARD ASSEMBLY - continued
153232

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 019	0078600		NOT ASSIGNED		
R 020	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 021	0078600		NOT ASSIGNED		
R 022	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 023	0071879		RESISTOR 82 OHM 1/4W 10% COMP	AB	RCR07G820KS
R 024	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 025	0071989		RESISTOR 3.3K OHM 1/4W 10% COMP	AB	RCR07G332KS
R 026	0083221		RESISTOR 4.42K OHM RN55C 1% MTL FLM	DP	RN55C4421F
R 027	0071977		RESISTOR 2.2K OHM 1/4W 10% COMP	AB	RCR07G222KS
R 028	0083916		RESISTOR 10.5K OHM RN55C 1% MTL FLM	DP	RN55C1052F
R 029	0080370		POT 250 OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV2511
R 030	0071897		RESISTOR 150 OHM 1/4W 10% COMP	AB	RCR07G151KS
R 031	0072189		RESISTOR 1.0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 032	0071951		RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 033	0071939		RESISTOR 680 OHM 1/2W 10% COMP	AB	RCR20G681KS
R 034	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 035	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 036	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 037	0071973		RESISTOR 1.8K OHM 1/4W 10% COMP	AB	RCR07G182KS
R 038	0071931		RESISTOR 560 OHM 1/4W 10% COMP	AB	RCR07G561KS
R 039	0071960		RESISTOR 1.2K OHM 1/4W 10% COMP	AB	RCR07G122KS
R 040	0071977		RESISTOR 2.2K OHM 1/4W 10% COMP	AB	RCR07G222KS
R 041	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 042	0071926		RESISTOR 470 OHM 1/4W 10% COMP	AB	RCR07G471KS
R 043	0072138		RESISTOR 220K OHM 1/4W 10% COMP	AB	RCR07G224KS
R 044	0071862		RESISTOR 47 OHM 1/4W 10% COMP	AB	RCR07G470KS
R 045	0072214		RESISTOR 4.7 MEG 1/4W 10% COMP	AB	RCR07G475KS
R 046	0071982		RESISTOR 2.7K OHM 1/4W 10% COMP	AB	RCR07G272KS
R 047	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 048	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 049	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 050	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 051	0072195		RESISTOR 1.2 MEG 1/4W 10% COMP	AB	RCR07G125KS
R 052	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 053	0072046		RESISTOR 18K OHM 1/4W 10% COMP	AB	RCR07G183KS
R 054	0072165		RESISTOR 470K OHM 1/4W 10% COMP	AB	RCR07G474KS
R 055	0072077		RESISTOR 47K OHM 1/4W 10% COMP	AB	RCR07G473KS
R 056	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 057	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 058	0072014		RESISTOR 6.8K OHM 1/4W 10% COMP	AB	RCR07G682KS
R 059	0071926		RESISTOR 470 OHM 1/4W 10% COMP	AB	RCR07G471KS
R 060	0077524		RESISTOR 75 OHM 1/4W 5% COMP	AB	RCR07G750JS
R 061	0071951		RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 062	0071931		RESISTOR 560 OHM 1/4W 10% COMP	AB	RCR07G561KS
R 063	0071853		RESISTOR 27 OHM 1/4W 10% COMP	AB	RCR07G270KS
R 064	0071897		RESISTOR 150 OHM 1/4W 10% COMP	AB	RCR07G151KS
R 065	0071919		RESISTOR 330 OHM 1/2W 10% COMP	AB	RCR20G331KS
R 066	0072039		RESISTOR 15K OHM 1/4W 10% COMP	AB	RCR07G153KS
R 068	0071951		RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 069	0072077		RESISTOR 47K OHM 1/4W 10% COMP	AB	RCR07G473KS
R 070	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 071	0071921		RESISTOR 390 OHM 1/2W 10% COMP	AB	RCR20G391KS
R 072	0071895		RESISTOR 120 OHM 1/2W 10% COMP	AB	RCR20G121KS
S 001	0086221		SWITCH ROCKER DPDT ON-OFF-ON PC MT	CK	7203J1V3BE
T 001	0123038		TRANSFORMER BALANCED MIXER		
U 001	0086218		IC OP AMP 14L-DIP 125C COMP QUAD 741	TI	RC4136N
U 002	0083021		IC CMOS COUNTER 12-BIT BINARY	MOS	MC14040BCL
U 003	0083021		IC CMOS COUNTER 12-BIT BINARY	MOS	MC14040BCL
U 004	0086219		IC PHASE/FREQ DET CMOS FOR PLL 16L-DIP	MOS	MC14046BCL
U 005	0083017		IC CMOS GATE NOR 2-IN QUAD	MOS	MC14001BCL
U 006	0079067		IC AMPL/LIMITER RF/IF/VIDEO 10L-T05	RCA	CA3012
U 007	0081795		IC MIXER DOUBLE BAL 100MHZ 14L-DIP	TI	TL442CN
U 008	0082382		IC AMPL CASCODE RF/IF DIFF IN 10L-T0100	MOS	MC1550G
Y 001	0153237		XTAL 1.125 MHZ		

PARTS LIST
VESTIGIAL SIDEBAND FILTER PW BOARD ASSEMBLY
153242

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0153242PPC		PREFORM FOR VESTIGIAL FILTER 6350		
	0153242WPC		WIRE PREP FOR VESTIGIAL FILTER 6350		
001	0153241		PWB VESTIGIAL FILTER		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
008	0230001		VESTIGAL SIDEBAND FILTER AUTO-INSERTION		
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 006	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 008	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 009	0073494		CAPACITR 22 PF 500V SILVER MICA 5%	CD	CD15ED220J03
C 010	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 011	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 012	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 014	0073495		CAPACITR 39 PF 500V SILVER MICA 5%	CD	CD15ED390J03
C 015	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 016	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
C 018	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 020	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 021	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 022	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 024	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 025	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 026	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 028	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 029	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 030	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 031	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 032	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 033	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 034	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 035	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 036	0070492		CAPACITR 33 PF 500V SILVER MICA 5%	CD	CD15ED330J03
C 037	0081536		CAPACITR 5-50 PF MIN PC MT	AE	MT10MA/550
C 038	0070490		CAPACITR 30 PF 500V SILVER MICA 5%	CD	CD15ED300J03
C 039	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 040	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 041	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 042	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 043	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 044	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 045	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G

PARTS LIST
VESTIGIAL SIDEBAND FILTER PW BOARD ASSEMBLY - continued
153242

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 046	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 047	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0086179		DIODE UM9301 PIN DIODE	UNC	UM9301
CR002	0086179		DIODE UM9301 PIN DIODE	UNC	UM9301
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 003	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 004	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
FL001	0153246		SAW FILTER		
J 004	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 005	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 006	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 007	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 008	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 009	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 010	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 011	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 012	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 013	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
L 001	0082345		INDUCTOR .82 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0082345		INDUCTOR .82 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0082361		INDUCTOR 10.5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 004	0082567		INDUCTOR 12.5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 005	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0082624		INDUCTOR 14.5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 010	0082624		INDUCTOR 14.5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 011	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
P 001	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
P 002	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
P 003	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
Q 001	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 002	0082348		TRANSSTR A492 NPN SIL	AE	A492
Q 003	0082348		TRANSSTR A492 NPN SIL	AE	A492
Q 004	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 005	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 006	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
R 001	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 002	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		

PARTS LIST
VESTIGIAL SIDEBAND FILTER PW BOARD ASSEMBLY - continued
153242

REF DESIG	PART NO.	EN KV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 003	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089026		RESISTOR 12 OHM 1/4W 5% CARBON FILM		
R 007	0071908		RESISTOR 220 OHM 1/2W 10% COMP	AB	RCR20G221KS
R 008	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 009	0089042		RESISTOR 56 OHM 1/4W 5% CARBON FILM		
R 010	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 011	0089116		RESISTOR 68K OHM 1/4W 5% CARBON FILM		
R 012	0089028		RESISTOR 15 OHM 1/4W 5% CARBON FILM		
R 013	0071942		RESISTOR 820 OHM 1/2W 10% COMP	AB	RCR20G821KS
R 014	0082346		POT 100 OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR101M
R 015	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 016	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 017	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 018	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 019	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 020	0071939		RESISTOR 680 OHM 1/2W 10% COMP	AB	RCR20G681KS
R 021	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 022	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 023	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 025	0089039		RESISTOR 43 OHM 1/4W 5% CARBON FILM		
R 026	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 027	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 028	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 029	0089026		RESISTOR 12 OHM 1/4W 5% CARBON FILM		
R 030	0071908		RESISTOR 220 OHM 1/2W 10% COMP	AB	RCR20G221KS
R 032	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 033	0089038		RESISTOR 39 OHM 1/4W 5% CARBON FILM		
R 034	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		
R 035	0089038		RESISTOR 39 OHM 1/4W 5% CARBON FILM		
R 036	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		
R 037	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 038	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 039	0089032		RESISTOR 22 OHM 1/4W 5% CARBON FILM		
R 040	0089042		RESISTOR 56 OHM 1/4W 5% CARBON FILM		
R 041	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 042	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 043	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 044	0089046		RESISTOR 82 OHM 1/4W 5% CARBON FILM		
R 045	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 046	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 047	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		
R 048	0089053		RESISTOR 160 OHM 1/4W 5% CARBON FILM		
R 049	0089030		RESISTOR 18 OHM 1/4W 5% CARBON FILM		
R 050	0089053		RESISTOR 160 OHM 1/4W 5% CARBON FILM		
R 051	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
T 001	0153279		TRANSFORMER BROADBAND		
T 002	0125739		TRANSFORMER MATCHING		
T 003	0125727		TRANSFORMER 2T, 6T TO 2T, 6T		
T 004	0036137		TRANSFORMER TWO-WAY SPLITTER		
T 005	0153279		TRANSFORMER BROADBAND		
XAT1	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
SUB-LOW OUTPUT CONVERTER LO PW BOARD ASSEMBLY
CHANNEL T7
230907

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230907WPC		WIREPREP FOR SUBLOW OUTPUT CONV		
001	0143085		PWB SUB LOW OUTPUT CONV L.O.		
002	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
003	0143086		ASSY SUB LOW OUTPUT CONV LO AUTO-INSERT		
C 001	0070531		CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0082394		CAPACITR 510 PF 100V SILVER MICA 5%	SGC	D151F511J03
C 004	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 005	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 006	0087125		CAPACITR 3.3-18 PF MIN CER PC MT	SP	GKU 18000
C 007	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 008	0070527		CAPACITR 200 PF 500V SILVER MICA 5%	CD	CD15FD201J03
C 009	0070527		CAPACITR 200 PF 500V SILVER MICA 5%	CD	CD15FD201J03
C 010	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 011	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 012	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0070492		CAPACITR 33 PF 500V SILVER MICA 5%	CD	CD15ED330J03
C 014	0073496		CAPACITR 56 PF 500V SILVER MICA 5%	CD	CD15ED560J03
C 015	0070492		CAPACITR 33 PF 500V SILVER MICA 5%	CD	CD15ED330J03
C 016	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
L 001	0082345		INDUCTOR .82 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0077954		INDUCTOR .47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
R 001	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	RON	R-25 BY DESCRIPTON
R 003	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 004	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 005	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 006	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 007	0089026		RESISTOR 12 OHM 1/4W 5% CARBON FILM		
R 008	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 009	0089026		RESISTOR 12 OHM 1/4W 5% CARBON FILM		
R 010	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 011	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 012	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 013	0089020		RESISTOR 6.8 OHM 1/4W 5% NICKEL FILM		
R 014	0071908		RESISTOR 220 OHM 1/2W 10% COMP	AB	RCR20G221KS
S 001	0084107		SWITCH TOG DPDT MIN SHORT HANDLE PC MT	CK	7201MCBE
T 001	0153279		TRANSFORMER BROADBAND		
W 001	0230930		CABLE INTERCONNECTING 9.50 IN.		
W 001	0230930		CABLE INTERCONNECTING 9.50 IN.		
W 002	0230922		CABLE INTERCONNECTING 4.50 IN.		
W 002	0230922		CABLE INTERCONNECTING 4.50 IN.		
XAT1	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
Y 001	0085877		CRYSTAL 52.75 MHZ IN H3W HOLDER	CKI	PER S-A SPEC. 83000

PARTS LIST
SUB-LOW BAND OUTPUT CONVERTER LO PWB
ASSEMBLY, CHANNELS T8 THROUGH T11,
PART NUMBERS 230908-230911

Note

The crystal, Y1, is the only component that changes according to channel. Refer to the chart on the schematic diagram, figure 8-12, for the value of the crystal used for channels T8 through T11.

PARTS LIST
OUTPUT CONVERTER BAND LO PWB ASSEMBLY CHANNEL 2
230302

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230302WPC		WIRE PREP FOR OX CH 2-13 & A-W		
001	0036100		PC BD LOCAL OSC OUTPUT CONV LO BAND		
002	0036135		ASSY LOW BAND OUTPUT CONV LO AUTO-INSERT		
003	0073318		WIRE 22 BUS	BM	8021
004	0230302PPC		PREFORM FOR OUTPUT CONVERTER LO PCB CH2		
AT001	0035876		ATTNUATR 3 DB FIXED T-PAD TO-5 CASE	NAM	KM5
C 001	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 002	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 003	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 004	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 005	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
C 006	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 007	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 008	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 009	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 010	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 011	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 014	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 015	0035761		CAPACITR 5.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-509C
C 016	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 017	0081931		CAPACITR 15 PF 500V CER DISC COG 5%	ER	831-COGO-150J
C 018	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 019	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 020	0081931		CAPACITR 15 PF 500V CER DISC COG 5%	ER	831-COGO-150J
C 021	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
CR001	0071143		DIODE 1N4735A SI ZEN 6.2V 5% 1W	MOS	1N4735A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081766		CORE BEAD FERRITE 14 .138X.037X.150L RED	STK	57-1829
L 001	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0077484		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	M	70F156A1
L 004	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0077484		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	M	70F156A1
L 006	0077484		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	M	70F156A1
L 007	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0089078		RESISTOR 1.8K OHM 1/4W 5% CARBON FILM		
R 002	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 003	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 004	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 005	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 006	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 007	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 008	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 009	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 010	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 011	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 012	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 013	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
S 001	0082347		SWITCH SLIDE DPDT .5A PC MT	SAI	C42315-A60-A1
XAT1	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
Y 001	0082321		CRYSTAL 101.00 MHZ .0025% SERIES RES	ERT	HC-18/U HOLDER

PARTS LIST
LOW-BAND OUTPUT CONVERTER LO PWB
ASSEMBLY, CHANNELS 3 THROUGH 6,
PART NUMBERS 230303-230306

Note

Reference designations C4, C5, L1, R5, and Y1 are the only components that change according to channel; refer to the chart on the schematic diagram, figure 8-14, for the value of those components.

PARTS LIST
OUTPUT CONVERTER MID-BAND LO PWB ASSEMBLY, CHANNEL A, PART NUMBER 230314

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230302WPC		WIRE PREP FOR OX CH 2-13 & A-W		
001	0036101		PC BD LOCAL OSC OUTPUT CONV HI BAND		
001	0232078		OUTPUT CONV LO AUTO INSERT ASSY CH A-I		
002	0230314PPC		PREFORM FOR OUTPUT CONV LO CH A		
003	0073318		WIRE 22 BUS	BM	8021
C 001	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 002	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 003	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 004	0081923		CAPACITR 6.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-609C
C 005	0081934		CAPACITR 18 PF 100V CER DISC COG 5%	ER	835-COGO-180J
C 006	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 007	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 008	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 009	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 010	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 011	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJO-229C
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 014	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 016	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 018	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 019	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJO-229C
C 020	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 021	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 022	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
C 023	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 024	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
CR001	0071143		DIODE 1N4735A SI ZEN 6.2V 5% 1W	MOS	1N4735A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081766		CORE BEAD FERRITE 14 ,138X,037X,150L RED	STK	57-1829
L 001	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0077954		INDUCTOR .47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079113		INDUCTOR .18 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0079113		INDUCTOR .18 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0089078		RESISTOR 1.8K OHM 1/4W 5% CARBON FILM		
R 002	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		

PARTS LIST
OUTPUT CONVERTER MID-BAND LO PWB ASSEMBLY, CHANNEL A, PART NUMBER 230314 - continued

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 003	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 004	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 005	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 007	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 008	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 009	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 010	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 011	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 012	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 013	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 014	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
S 001	0082347		SWITCH SLIDE DPDT .5A PC MT	SAI	C42315-A60-A1
Y 001	0082551		CRYSTAL 83.50 MHZ .0025% SERIES RES	ERT	HC-18/U HOLDER

PARTS LIST
MID-BAND OUTPUT CONVERTER LO PWB
ASSEMBLY, CHANNELS B THROUGH I,
PART NUMBERS 230315-230322

Note

Reference designations L2, L9, and Y1 are the only components in the mid-band that change according to channel; refer to the chart on the schematic diagram, figure 8-16, for the value of those components.

PARTS LIST
OUTPUT CONVERTER HIGH BAND LO PWB ASSEMBLY, CHANNEL 7, PART NUMBER 230307

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230302WPC		WIRE PREP FOR OX CH 2-13 & A-W		
001	0036101		PC BD LOCAL OSC OUTPUT CONV HI BAND		
001	0036136		ASSY HI BAND OUTPUT CONV LO AUTO INSERT		
003	0073318		WIRE 22 BUS	BM	8021
004	0230307PPC		PREFORM FOR OUTPUT CONVERTER LO PCB CH 7		
C 001	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 002	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 003	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 004	0081923		CAPACITR 6.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-609C
C 005	0081934		CAPACITR 18 PF 100V CER DISC COG 5%	ER	835-COGO-180J
C 006	0078600		NOT ASSIGNED		
C 007	0070492		CAPACITR 33 PF 500V SILVER MICA 5%	CD	CD15ED330J03
C 008	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 009	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 010	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 011	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJO-229C
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 014	0078600		NOT ASSIGNED		
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 016	0070492		CAPACITR 33 PF 500V SILVER MICA 5%	CD	CD15ED330J03
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 018	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 019	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJO-229C
C 020	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 021	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 022	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
C 023	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 024	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-409C
CR001	0071143		DIODE 1N4735A SI ZEN 6.2V 5% 1W	MOS	1N4735A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081766		CORE BEAD FERRITE 14 .138X.037X.150L RED	STK	57-1829
L 001	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 004	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 007	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0089078		RESISTOR 1.8K OHM 1/4W 5% CARBON FILM		
R 002	0089078		RESISTOR 1.8K OHM 1/4W 5% CARBON FILM		
R 003	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 004	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 005	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 007	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 008	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 009	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 010	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 011	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 012	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 013	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 014	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
S 001	0082347		SWITCH SLIDE DPDT .5A PC MT	SAI	C42315-A60-A1
Y 001	0082323		CRYSTAL 110.50 MHZ .0025% SERIES RES	ERT	HC-18/U HOLDER

PARTS LIST
OUTPUT CONVERTER HIGH BAND LO PWB ASSEMBLY,
CHANNELS 8 THROUGH 13, PART NUMBERS 230308-230313

Note

Reference designations L2 and Y1 are the only components in the high band that change according to channel; refer to the chart on the schematic diagram, figure 8-16, for the value of those components.

PARTS LIST
SUPER-BAND OUTPUT CONVERTER LO PWB ASSEMBLY, CHANNEL J, PART NUMBER 230323

REF DESIG	PART NO,	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230302WPC		WIRE PREP FOR OX CH 2-13 & A-W		
001	0036101		PC BD LOCAL OSC OUTPUT CONV HI BAND		
001	0232079		OUTPUT CONV LO AUTO INSERT ASSY CH J-W		
002	0230323PPC		PREFORM FOR OUTPUT CONV LO CH J		
003	0073318		WIRE 22 BUS	RM	8021
C 001	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 002	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 003	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 004	0081923		CAPACITR 6,0 PF 500V CER DISC COH +-,25P	ER	831-COHO-609C
C 005	0081934		CAPACITR 18 PF 100V CER DISC COG 5%	ER	835-COGO-180J
C 006	0078600		NOT ASSIGNED		
C 007	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 008	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 009	0070549		CAPACITR ,0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 010	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 011	0081971		CAPACITR 2,2 PF 100V CER DISC COJ +-,25P	ER	835-024-COJO-229C
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 014	0078600		NOT ASSIGNED		
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 016	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 018	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 019	0081971		CAPACITR 2,2 PF 100V CER DISC COJ +-,25P	ER	835-024-COJO-229C
C 020	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 021	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 022	0035760		CAPACITR 4,0 PF 500V CER DISC COH +-,25P	ER	831-COHO-409C
C 023	0035762		CAPACITR 8,0 PF 500V CER DISC COH +-,25P	ER	831-COHO-809C
C 024	0035760		CAPACITR 4,0 PF 500V CER DISC COH +-,25P	ER	831-COHO-409C
CR001	0071143		DIODE 1N4735A SI ZEN 6,2V 5% 1W	MOS	1N4735A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
E 001	0081766		CORE BEAD FERRITE 14 ,138X,037X,150L RED	STK	57-1829
L 001	0079165		INDUCTOR ,1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079113		INDUCTOR ,18 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079170		INDUCTOR ,05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 004	0079169		INDUCTOR 1,0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079169		INDUCTOR 1,0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079170		INDUCTOR ,05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 007	0079169		INDUCTOR 1,0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079165		INDUCTOR ,1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0079165		INDUCTOR ,1 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0089078		RESISTOR 1,8K OHM 1/4W 5% CARBON FILM		
R 002	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 003	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 004	0078600		NOT ASSIGNED		
R 005	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089074		RESISTOR 1,2K OHM 1/4W 5% CARBON FILM		
R 007	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 008	0089092		RESISTOR 6,8K OHM 1/4W 5% CARBON FILM		
R 009	0089084		RESISTOR 3,3K OHM 1/4W 5% CARBON FILM		
R 010	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 011	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 012	0089016		RESISTOR 4,7 OHM 1/4W 5% NICKEL FILM		
R 013	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 014	0089016		RESISTOR 4,7 OHM 1/4W 5% NICKEL FILM		
S 001	0082347		SWITCH SLIDE DPDT ,5A PC MT	SAI	C42315-A60-A1
Y 001	0082560		CRYSTAL 131,50 MHZ ,0025% SERIES RES	ERT	HC-18/U HOLDER

PARTS LIST
SUPER-BAND OUTPUT CONVERTER LO PWB ASSEMBLY,
CHANNELS K THROUGH W, PART NUMBERS 230324-230336

Note

Reference designations C7, C10, C11, C16, C18, C19, L1, L2, L8, L9, and Y1 are the components in the super band that change according to channel; refer to the schematic diagram, figure 8-16, for the value of those components.

PARTS LIST
SUB-LOW OUTPUT CONVERTER PWB ASSEMBLY, CHANNEL T7, PART NUMBER 230707

REF DESIG	PART NO.	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0143165	PWB SUB LOW OUTPUT CONV		
002	0081631	SOCKET PIN .016-.019 OPEN BOTTOM	CTC	450-3772-01-06-00
003	0081258	CONN COAX F FEM TO PC BRD CHSS OR PC MT	GIL	GF-61-A-PC
004	0073318	WIRE 22 BUS	BM	8021
005	0079335	PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
006	0123468	SHIELD CAN SMALL	JLO	PER SA DWG 123468
C 001	0070531	CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 002	0070522	CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 003	0070531	CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 004	0073497	CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 005	0073497	CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 006	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 007	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 008	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 009	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 011	0070534	CAPACITR 330 PF 500V SILVER MICA 5%	CD	CD15FD331J03
C 013	0070522	CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 014	0070531	CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 015	0070522	CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 016	0073495	CAPACITR 39 PF 500V SILVER MICA 5%	CD	CD15ED390J03
C 017	0087125	CAPACITR 3,3-18 PF MIN CER PC MT	SP	GKU 18000
C 018	0070509	CAPACITR 68 PF 500V SILVER MICA 5%	CD	CD15ED680J03
C 019	0073490	CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 020	0070549	CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 021	0070549	CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 022	0070549	CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0070549	CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 024	0070549	CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0085156	DIODE 6-4007 MIX HIGH DRIVE SCHOTT, QUAD	APH	6-4007-00
J 001	0081632	SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 002	0081632	SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 003	0081632	SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
L 001	0082360	INDUCTOR 9,5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 002	0082624	INDUCTOR 14,5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 003	0082360	INDUCTOR 9,5T #22 START MP2 10-32X3/8 J	XZ	BY DESCRIPTION
L 004	0082592	INDUCTOR .56 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0081850	INDUCTOR 2,7 UH SUBMIN UNSHLD 5%	DP	IR-2
L 009	0082456	INDUCTOR 23,5T #22 ST MP1 2 10-32X3/8 J	XZ	BY DESCRIPTION
L 010	0078134	INDUCTOR 1,2 UH SUBMIN UNSHLD 10%	DP	IR-2
L 011	0078134	INDUCTOR 1,2 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0077954	INDUCTOR .47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 013	0079330	INDUCTOR .22 UH SUBMIN UNSHLD 10%	DP	IR-2
L 014	0079169	INDUCTOR 1,0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 015	0079169	INDUCTOR 1,0 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
SUB-LOW OUTPUT CONVERTER PWB ASSEMBLY, CHANNEL T7, PART NUMBER 230707 - continued

REF DESIG	PART NO.	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 016	0079169	INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
P 001	0082455	JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
Q 001	0085042	TRANSTR MRF 517 NPN SIL	MOS	MRF 517
R 001	0072026	RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 002	0072026	RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 003	0071931	RESISTOR 560 OHM 1/4W 10% COMP	AB	RCR07G561KS
R 004	0076277	RESISTOR 12 OHM 1/4W 10% COMP	AB	RCR07G120KS
R 005	0071908	RESISTOR 220 OHM 1/2W 10% COMP	AB	RCR20G221KS
R 006	0077524	RESISTOR 75 OHM 1/4W 5% COMP	AB	RCR07G750JS
R 007	0071894	RESISTOR 120 OHM 1/4W 10% COMP	AB	RCR07G121KS
R 008	0071926	RESISTOR 470 OHM 1/4W 10% COMP	AB	RCR07G471KS
R 009	0071853	RESISTOR 27 OHM 1/4W 10% COMP	AB	RCR07G270KS
R 010	0071926	RESISTOR 470 OHM 1/4W 10% COMP	AB	RCR07G471KS
R 011	0071876	RESISTOR 68 OHM 1/4W 10% COMP	AB	RCR07G680KS
T 001	0153278	TRANSFORMER BALUN		
T 002	0153277	TRANSFORMER MIXER		
T 003	0153277	TRANSFORMER MIXER		
T 004	0153278	TRANSFORMER BALUN		
T 005	0153279	TRANSFORMER BROADBAND		
T 006	0153275	TRANSFORMER 20DBTAP		
W 001	0036585	CABLE INTERCONNECTING		
W 002	0036581	CABLE INTERCONNECTING		
XAT1	0081666	SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
SUB-LOW OUTPUT CONVERTER PWB ASSEMBLY,
CHANNELS T8 THROUGH T11, PART NUMBERS 230708-230711

Note

The following components vary according to channel: C1-C5, C10-C15, L1, L2, L3, and L5-L11; refer to the chart on the schematic diagram, figure 8-18, for the value of those components.

PARTS LIST
OUTPUT CONVERTER PWB ASSEMBLY
231302 - 231336
(CHANNEL 2, P/L 231302, LISTED BELOW)

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0231302PPC		PREFORM FOR OUTPUT CONVERTER CH 2		KUP11D55
	0231302WPC		WIRE PREP FOR OUTPUT CONVERTER CH 2-W		LM1886
001	0229895		PC BD OUTPUT CONV		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0081631		SOCKET PIN .016-.019 OPEN BOTTOM	CTC	450-3772-01-06-00
004	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
005	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
006	0229904		LO SHIELD PARTITION		
007	0073318		WIRE 22 BUS	BM	8021
008	0229896		ASSY OUTPUT CONVERTER AUTO-INSERTION		
C 001	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 002	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 003	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 004	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 008	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 009	0080142		CAPACITR 20 PF 500V SILVER MICA 5%	CD	CD15ED200J03
C 011	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 012	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 014	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 015	0081830		CAPACITR 35 PF 500V SILVER MICA 2%	SGC	D155C350G03
C 016	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 019	0080142		CAPACITR 20 PF 500V SILVER MICA 5%	CD	CD15ED200J03
C 020	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 021	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 022	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 024	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 025	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 026	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COKO-209C
C 027	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 028	0078600		NOT ASSIGNED		
C 029	0070501		CAPACITR 47 PF 1 KV CER DISC S2L 10%	CRL	DD-470
C 031	0081923		CAPACITR 6.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-609C
C 032	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 1033	0081923		CAPACITR 6.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-609C
C 034	0070501		CAPACITR 47 PF 1 KV CER DISC S2L 10%	CRL	DD-470
C 036	0078600		NOT ASSIGNED		
C 037	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 038	0035761		CAPACITR 5.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-509C
CR001	0080004		DIODE 5082-2805 DEI UHF SCHOTTKY QUAD	HP	5082-2805
J 002	0081258		CONN COAX F FEM TO PC BRD CHSS OR PC MT	GIL	GF-61-A-PC
L 001	0229903		RF CHOKE-MIXER		

PARTS LIST
OUTPUT CONVERTER PWB ASSEMBLY
231302 - 231336
(CHANNEL 2, P/L 231302, LISTED BELOW)
-continued

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 002	0229903		RF CHOKE-MIXER		
L 004	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0082358		INDUCTOR 6.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 010	0078134		INDUCTOR 1.2 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0082358		INDUCTOR 6.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 013	0078134		INDUCTOR 1.2 UH SUBMIN UNSHLD 10%	DP	IR-2
L 014	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 015	0082358		INDUCTOR 6.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 016	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 017	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 018	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 019	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 020	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 021	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
P 001	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
Q 001	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
R 001	0089050		RESISTOR 120 OHM 1/4W 5% CARBON FILM		
R 002	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 003	0089050		RESISTOR 120 OHM 1/4W 5% CARBON FILM		
R 004	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 005	0089078		RESISTOR 1.8K OHM 1/4W 5% CARBON FILM		
R 006	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 007	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 008	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 009	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 010	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 011	0089028		RESISTOR 15 OHM 1/4W 5% CARBON FILM		
R 012	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 013	0089016		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 014	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
T 001	0123038		TRANSFORMER BALANCED MIXER		
T 002	0123038		TRANSFORMER BALANCED MIXER		
T 003	0035890		TRANSFORMER 1T, 4T		
T 004	0035895		TRANSFORMER 20 DB TEST 5-300 MHZ		
XAT1	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

Note

The following components vary according to channel: C6, C9, C10, C15, C19, C27-C31, C33, C34, C37, L3, L5, L7, L9, L10, L12-L15, L18-L20, L21, and L26; refer to the chart on the schematic diagram, figure 8-20 (sheet 2), for the value of those components.

PARTS LIST
HYPERBAND OUTPUT CONVERTER MODULE ASSEMBLY
CHANNEL AA (TYPICAL) SHOWN
231580

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0232180		PWB ASSY OUTPUT CONV CHANNEL AA		
002	0116547		MODULE CASTING		
003	0230754		PANEL, FRONT-OUTPUT CONV CHANNEL AA		
004	0036250		COVER MODULE		
005	0077322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500		MODULE HANDLE PLASTIC "T"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
008	0232198		COVER OUTPUT CONVERTER		
009	0082210		SPACER 4-40 ID 3/16 OD 1/4 L HEX CD BRS	KEE	1450
010	0072309		SCREW 4-40 X 3/16 PAN HD,SST	XZ	PER MS51957-12
011	0073265		WASHER NO. 4 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
012	0072378		SCREW 6-32 X 3/4 PAN HD,SST	XZ	PER MS51957-32
013	0073269		WASHER NO. 6 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
014	0075446		NUT 6-32 UNC-2B,PLAIN-HEX,SST	XZ	PER MS35649-264
015	0036148		WASHER 3/8 FOR RF CONNECTORS	SA	PER DWG 36148
A 003	0230169		HYBRID CIRCUIT OUTPUT 400 MHZ	TRW	
AT001	0035877		ATTNUATR 6 DB FIXED T-PAD TO-5 CASE	NAM	KM4
J 001	0077426		CONN COAX F PUSH ON FEM TO LUG CHASIS MT	GIL	GSK-59F
J 002	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 003	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 004	0080368		CONN COAX F FEM TO TERM THREADED DBL D	CEL	CF-61A

PARTS LIST
HYPERBAND OUTPUT CONVERTER PWB ASSEMBLY
232180 - 232197
(CHANNEL AA, P/L 232180, LISTED BELOW)

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0232180WPC		ASSY-WIRE/PREP 6150 HYPERBAND		
001	0231971		PWB, HYPERBAND OUTPUT CONVERTER		
002	0081631		SOCKET PIN .016-.019 OPEN BOTTOM	CTC	450-3772-01-06-00
004	0231976		SHIELD OUTPUT CONVERTER		
005	0086617		SPRING FINGER CONTACT STRIP	ISC	97-538-A
XAT1	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
A 001	0089245		HYBRID AMPL 0-400MHZ 14DB GAIN 25MA TO39		
A 002	0170515		HYBRID AMPL 0-400MHZ 14DB GAIN 60MA TO39	MOS	MWA130
A 004	0170775		MIXER DOUBLE BALANCED 1-500 MHZ SELECTED	MCT	SBL-1H
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0082003		CAPACITR 2.7 PF 100V CER DISC COJ +-.25P	TPT	835-024-COJO-279C
C 004	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 005	0170668		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-037-D 9-35
C 006	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 007	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-409C
C 008	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 009	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 010	0082003		CAPACITR 2.7 PF 100V CER DISC COJ +-.25P	TPT	835-024-COJO-279C
C 011	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 012	0170668		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-037-D 9-35
C 013	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 014	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-409C
C 015	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 016	0070540		CAPACITR 470 PF 1KV CER DISC Z5F 10%	CRL	DD-471
C 017	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 019	0082003		CAPACITR 2.7 PF 100V CER DISC COJ +-.25P	TPT	835-024-COJO-279C
C 020	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 021	0170668		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-037-D 9-35
C 022	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 023	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-409C
C 024	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 025	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
E 001	00868R4		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
E 002	0086884		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
J 005	0085125		CONN HEADER DBL ROW STRAIGHT 4-PIN PC	AMP	87227-2
J 006	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
J 007	0085125		CONN HEADER DBL ROW STRAIGHT 4-PIN PC	AMP	87227-2
J 008	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
L 001	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0231977		COIL OUTPUT CONVERTER		
L 007	0231977		COIL OUTPUT CONVERTER		
L 008	0231977		COIL OUTPUT CONVERTER		
L 009	0231977		COIL OUTPUT CONVERTER		
L 010	0231977		COIL OUTPUT CONVERTER		
L 011	0231977		COIL OUTPUT CONVERTER		
R 001	0089039		RESISTOR 43 OHM 1/4W 5% CARBON FILM		
R 002	0089047		RESISTOR 91 OHM 1/4W 5% CARBON FILM		
R 003	0170590		RESISTOR 620 OHM 1W 5% COMP	AB	RCR32G621JS
R 004	0089033		RESISTOR 24 OHM 1/4W 5% CARBON FILM		
R 005	0170589		RESISTOR 120 OHM 1W 5% COMP	AB	RCR32G121JS
R 006	0170589		RESISTOR 120 OHM 1W 5% COMP	AB	RCR32G121JS
R 007	0089033		RESISTOR 24 OHM 1/4W 5% CARBON FILM		
R 008	0078916		RESISTOR 665 OHM RN55C 1% MTL FLM		
R 009	0073318		WIRE 22 BUS	BM	8021
W 001	0231301		CABLE OUTPUT CONVERTER		
W 002	0230921		CABLE INTERCONNECTING 4.00 IN		
W 003	0073318		WIRE 22 BUS	BM	8021
W 004	0073318		WIRE 22 BUS	BM	8021

PARTS LIST
HYPERBAND OUTPUT CONVERTER PWB ASSEMBLY
232180 - 232197
(CHANNEL BB - QQ. See Note Below)

Note

The following components vary according to channel: C3, C4, C6, C7, C10, C11, C13, C14, C19, C20, C22, C23, R8, and R9; refer to the chart on the schematic diagram, figure 8-23, for the value of those components.

PARTS LIST
EXTENDED HYPERBAND OUTPUT CONVERTER MODULE ASSEMBLY
275137 - 275142
(CHANNEL RR, P/L 375137, LISTED BELOW)

REF DESTG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0275154		SCHEMATIC OUTPUT CONV CH RR=WW		
	0275155		TEST PROCEDURE OUTPUT CONV CH RR=WW		
	0275159		TEST SPECIFICATION EXTENDED HYPERBAND OC		
001	0275153		PWR ASSY OUTPUT CONV CH RR=WW		
002	0116547		MODULE CASTING		
003	0230905		PANEL, FRONT OUTPUT CONV CHANNEL RR		
004	0036250	D	COVER MODULE		
005	0077322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500	B	MODULE HANDLE PLASTIC "T"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
008	0275158		COVER EXTENDED HYPERBAND OUTPUT CONV		
009	0082210		SPACER 4-40 ID 3/16 OD 1/4 L HEX CD BRS	KEE	1450
010	0072309		SCREW 4-40 X 3/16 PAN HD,SST	XZ	PER MS51957-12
011	0073265		WASHER NO. 4 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
012	0072378		SCREW 6-32 X 3/4 PAN HD,SST	XZ	PER MS51957-32
013	0073269		WASHER NO. 6 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
014	0075446		NUT 6-32 UNC-2B,PLAIN-HEX,SST	XZ	PER MS35649-264
015	0036148		WASHER 3/8 FOR RF CONNECTORS	SA	PER DWG 36148
016	0073268		WASHER NO. 6 LOCK, SPLIT, CAD PLT STL	XZ	ANSI B18.21.1
017	0073318		WIRE 22 BUS	RM	8021
018	0086617		SPRING FINGER CONTACT STRIP	ISC	97-538-A
AT001	0035877		ATTENUATR 6 DB FIXED T-PAD TO-5 CASE	NAM	KM4
J 004	0077426		CONN COAX F PUSH ON FEM TO LUG CHASIS MT	GIL	GSK-59F
J 005	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 006	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 007	0080368		CONN COAX F FEM TO TERM THREADED DBL D	CEL	CF-61A
U 004	0234491		HYBRID 440MHZ OUTPUT		

Note

Parts lists for 275138 - 275142 are not listed because of duplication; only the front panel cover is different for channels SS - WW.

PARTS LISTS
EXTENDED HYPERBAND OUTPUT CONVERTER PWB ASSEMBLY
275153

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0275151		PWB OUTPUT CONVERTER CH RR=WW		
003	0231976		SHIELD OUTPUT CONVERTER		
004	0073318		WIRE 22 BUS	BM	8021
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 006	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0170794		CAPACITR .01 MF 50V CER DISC Y5P 20%	CRL	UK50-103
C 008	0082008		CAPACITR 4.7 PF 100V CER DISC COH +-.25P	TPT	835-024-COH0-479C
C 009	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 010	0082008		CAPACITR 4.7 PF 100V CER DISC COH +-.25P	TPT	835-024-COH0-479C
C 011	0170667		CAPACITR 5.5-18 PF MIN CER DISC PC MT	ER	538-037-A 5.5-18
C 012	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 013	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 014	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 015	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 016	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 017	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 019	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 020	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 021	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 022	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	TPT	831-COJ0-309C
C 024	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	TPT	835-024-COJ0-229C
C 025	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 026	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 027	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 028	0170667		CAPACITR 5.5-18 PF MIN CER DISC PC MT	ER	538-037-A 5.5-18
C 030	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 031	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	TPT	831-COK0-109C
C 032	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	TPT	831-COJ0-309C
C 039	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 040	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
E 001	0086884		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
E 002	0086884		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
E 003	0086884		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
J 001	0085125		CONN HEADER DBL ROW STRAIGHT 4-PIN PC	AMP	87227-2
J 002	0085125		CONN HEADER DBL ROW STRAIGHT 4-PIN PC	AMP	87227-2
J 003	0085125		CONN HEADER DBL ROW STRAIGHT 4-PIN PC	AMP	87227-2
L 002	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0275156		INDUCTOR OUTPUT CONV CH RR=WW		
L 006	0275156		INDUCTOR OUTPUT CONV CH RR=WW		
L 007	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
EXTENDED HYPERBAND OUTPUT CONVERTER
PWB ASSEMBLY - continued
275153

PART# 0275153 EN/RV DESCRIPTION: PWB ASSY OUTPUT CONV CH RR-WW

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 008	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 010	0275156		INDUCTOR OUTPUT CONV CH RR-WW		
L 011	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 013	0085542		INDUCTOR 2 1/2T #22 HORIZ PC MT AIR CORE	SML	LM-2 BY DESCRIPTION
L 014	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 015	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 016	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 017	0275156		INDUCTOR OUTPUT CONV CH RR-WW		
L 018	0275156		INDUCTOR OUTPUT CONV CH RR-WW		
L 019	0081082		INDUCTOR .12 UH SUBMIN UNSHLD 10%	DP	IR-2
L 020	0275156		INDUCTOR OUTPUT CONV CH RR-WW		
Q 001	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
R 003	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 004	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 005	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 006	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 007	0071919		RESISTOR 330 OHM 1/2W 10% COMP	AB	RCR20G331KS
R 008	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 009	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 010	0089039		RESISTOR 43 OHM 1/4W 5% CARBON FILM		
R 011	0071928		RESISTOR 470 OHM 1W 10% COMP	AB	RCR32G471KS
R 012	0071928		RESISTOR 470 OHM 1W 10% COMP	AB	RCR32G471KS
R 013	0071928		RESISTOR 470 OHM 1W 10% COMP	AB	RCR32G471KS
R 014	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 015	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 016	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 017	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 018	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 019	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 020	0089042		RESISTOR 56 OHM 1/4W 5% CARBON FILM		
TP001	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
TP002	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
U 001	0170775		MIXER DOUBLE BALANCED 1-500 MHZ SELECTED	MCT	SBL-1H
U 002	0089245		HYBRID AMPL 0-400MHZ 14DB GAIN 25MA TO39		
U 003	0170515		HYBRID AMPL 0-400MHZ 14DB GAIN 60MA TO39	MOS	MWA130
W 001	0231301		CABLE OUTPUT CONVERTER		
W 002	0230921	C	CABLE INTERCONNECTING 4.00 IN		
W 003	0170686		JUMPER INSULATED BODY .205 IN. LONG T&R	TEV	WL 40
XA001	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
VIDEO SWITCH OPTION PWB ASSEMBLY
164221

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
	0164221WPC		ASSY VIDEO SWITCH WIRE PREP		
001	0153201		PWB VIDEO SWITCH/AGC		
002	0073045		CABLE TIE - MINIATURE - 4 IN. LONG	PAN	SST1M
C 001	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 002	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 003	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 004	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 005	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 006	0070536		CAPACITR 390 PF 500V SILVER MICA 5%	CD	CD15FD391J03
C 007	0070553		CAPACITR .0022 MF 100V POLYESTER 10%	CD	WMF1D22
C 008	0070553		CAPACITR .0022 MF 100V POLYESTER 10%	CD	WMF1D22
C 009	0035653		CAPACITR 1.0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 010	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 011	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 012	0035653		CAPACITR 1.0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 013	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 014	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 015	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 016	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 017	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 018	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 019	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 020	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 021	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 022	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 023	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
CR001	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR004	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0078714		DIODE 1N4744A SI ZEN 15V 5% 1W	MOS	1N4744A
L 001	0078600		NOT ASSIGNED		
L 002	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 006	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 010	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 011	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947

PARTS LIST
VIDEO SWITCH OPTION PWB ASSEMBLY - continued
164221

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
Q 012	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 013	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 014	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 015	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 016	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 017	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 018	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 019	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 001	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 002	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 003	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 004	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 005	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 006	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROH	R-25 BY DESCRIPTON
R 007	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 008	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 009	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 010	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 011	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 012	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 013	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 014	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 015	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 016	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 017	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 018	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 019	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 020	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 021	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 022	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 023	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 024	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 025	0072189		RESISTOR 1.0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 026	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 027	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 028	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 029	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 030	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 031	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 032	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 033	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 034	0072002		RESISTOR 4.7K OHM 1/4W 10% COMP	AB	RCR07G472KS
R 035	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 036	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 037	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 038	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 039	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO SWITCH OPTION PWB ASSEMBLY - continued
164221

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 040	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 041	0071951		RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 042	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 043	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 044	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 045	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 046	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 047	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 048	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 049	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 050	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 051	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 052	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 053	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 054	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 055	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 056	0071918		RESISTOR 330 OHM 1/4W 10% COMP	AB	RCR07G331KS
R 057	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 058	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 059	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 060	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 061	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 062	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 063	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 064	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 065	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 066	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 067	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 068	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 069	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
U 001	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N

PARTS LIST
VIDEO AGC PWB ASSEMBLY
164231

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0073045		CABLE TIE - MINIATURE - 4 IN. LONG	PAN	SST1M
	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
	0164231MPC		ASSY VAGC WIRE PREP		
001	0153201		PWB VIDEO SWITCH/AGC		
C 001	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 002	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 003	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 005	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 006	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 007	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 008	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 009	0073494		CAPACITR 22 PF 500V SILVER MICA 5%	CD	CD15ED220J03
C 010	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 011	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 012	0081117		CAPACITR .0023 MF 100V SILVER MICA 5%	SGC	D191C232J03
C 013	0035653		CAPACITR 1.0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 014	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 015	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 016	0070490		CAPACITR 30 PF 500V SILVER MICA 5%	CD	CD15ED300J03
C 017	0070527		CAPACITR 200 PF 500V SILVER MICA 5%	CD	CD15FD201J03
C 018	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
C 019	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 020	0070531		CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 021	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 022	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 023	0077958		CAPACITR 680 PF 100V SILVER MICA 2%	CD	CD7FA681G03
C 024	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 025	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 026	0081332		CAPACITR 950 PF 100V SILVER MICA 5%	SGC	D151C951J03
C 027	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 028	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 029	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 030	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 031	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 032	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 033	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
CR001	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR002	0078714		DIODE 1N4744A SI ZEN 15V 5% 1W	MOS	1N4744A
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR004	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR007	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR008	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR009	0071143		DIODE 1N4735A SI ZEN 6.2V 5% 1W	MOS	1N4735A
CR010	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR011	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A

PARTS LIST
VIDEO AGC PWB ASSEMBLY - continued
164231

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 001	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079716		INDUCTOR 100 UH SUBMIN UNSHLD 10%	DP	IR-2
LDR1	0086254		OPTO-ISOLATOR PHOTOCONDUCTIVE WIRE LEADS	CLX	CLM6000
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 010	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 011	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 012	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 013	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 014	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 015	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 016	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 017	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 018	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 019	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 020	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 021	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 022	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 001	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 002	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 003	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 004	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 005	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 006	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 007	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 008	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 009	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 010	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 011	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 012	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 013	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 014	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 015	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 016	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 017	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 018	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 019	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 020	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO AGC PWB ASSEMBLY - continued
164231

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 021	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 022	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 023	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 024	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 025	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 026	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 027	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 028	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 029	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 030	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 031	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 032	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 033	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 034	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 035	0072189		RESISTOR 1.0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 036	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 037	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 038	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 039	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 040	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 041	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 042	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 043	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 044	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 045	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		
R 046	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 047	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 048	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 049	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 050	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 051	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 052	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 053	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 054	0086223		POT 25K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR25K
R 055	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 056	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 057	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 058	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 059	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 060	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 061	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 062	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 063	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 064	0072076		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 065	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 066	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 067	0071887		RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
R 068	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 069	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 070	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 071	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 072	0086223		POT 25K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR25K
R 073	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		
R 074	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 075	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 076	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 077	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 078	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 079	0072064		RESISTOR 33K OHM 1/4W 10% COMP	AB	RCR07G333KS
R 081	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 082	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 083	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 084	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 085	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 086	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 087	0072198		RESISTOR 1.5 MEG 1/4W 10% COMP	AB	RCR07G155KS
R 088	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
U 001	0083623		IC CMOS MULTI MONO RETRIG DUAL	MOS	MC14528BCL
U 002	0084890		IC OP AMP 8L-DIP 70C COMP 741C	MOS	MC1741CP1
U 003	0081901		IC OP AMP JFET 8L-TO39 85C COMP	NSC	LH0042CH
U 004	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A

PARTS LIST
VIDEO SWITCH/AGC PWB ASSEMBLY
153202

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0086759		SPACER LEAD, GLASS BEAD GREEN	MCO	2120L GREEN
	0153202SPC		SUB ASSY FOR VS/VAGC		
	0153202WPC		WIRE PREP FOR VS/VAGC		
001	0153201		PWB VIDEO SWITCH/AGC		
C 001	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 002	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 003	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0070536		CAPACITR 390 PF 500V SILVER MICA 5%	CD	CD15FD391J03
C 005	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 006	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 007	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 008	0070553		CAPACITR .0022 MF 100V POLYESTER 10%	CD	WMF1D22
C 009	0070553		CAPACITR .0022 MF 100V POLYESTER 10%	CD	WMF1D22
C 010	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 011	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 012	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 013	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 014	0035653		CAPACITR 1.0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 015	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4
C 016	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 017	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 018	0073494		CAPACITR 22 PF 500V SILVER MICA 5%	CD	CD15ED220J03
C 019	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 020	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 021	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 022	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 023	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 024	0081117		CAPACITR .0023 MF 100V SILVER MICA 5%	SGC	D191C232J03
C 025	0035653		CAPACITR 1.0 MF 35V SOLID TANT POL 20%	KEM	T362A105M035AS
C 026	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 027	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 028	0070490		CAPACITR 30 PF 500V SILVER MICA 5%	CD	CD15ED300J03
C 029	0070527		CAPACITR 200 PF 500V SILVER MICA 5%	CD	CD15FD201J03
C 030	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
C 031	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 032	0077967		CAPACITR 270 PF 300V SILVER MICA 2%	CD	CD7FC271G03
C 033	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 034	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 035	0077958		CAPACITR 680 PF 100V SILVER MICA 2%	CD	CD7FA681G03
C 036	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 037	0070517		CAPACITR 100 PF 500V SILVER MICA 5%	CD	CD15FD101J03
C 038	0070529		CAPACITR 220 PF 500V SILVER MICA 5%	CD	CD15FD221J03
C 039	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 040	0081332		CAPACITR 950 PF 100V SILVER MICA 5%	SGC	D151C951J03
C 041	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 042	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 043	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 044	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 046	0083574		CAPACITR 68 MF 25V SOLID TANT POL 20%	SP	196D686X0025TE4

PARTS LIST
VIDEO SWITCH/AGC PWB ASSEMBLY - continued
153202

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
CR001	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR004	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR005	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0078714		DIODE 1N4744A SI ZEN 15V 5% 1W	MOS	1N4744A
CR007	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR008	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR009	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR010	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR011	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR012	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR013	0071143		DIODE 1N4735A SI ZEN 6.2V 5% 1W	MOS	1N4735A
CR014	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR015	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
L 001	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079926		INDUCTOR 10 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0078716		INDUCTOR 100 UH SUBMIN UNSHLD 10%	DP	IR-2
LDR1	0086254		OPTO-ISOLATOR PHOTOCONDUCTIVE WIRE LEADS	CLX	CLM6000
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 006	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 010	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 011	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 012	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 013	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 014	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 015	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 016	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 017	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 018	0079660		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 019	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 020	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 021	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 022	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 023	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 024	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 025	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 026	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947

PARTS LIST
VIDEO SWITCH/AGC PWB ASSEMBLY - continued
153202

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
Q 027	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 028	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 029	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 030	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 031	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 032	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 033	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 034	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 001	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 002	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 003	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 004	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 005	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 006	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 007	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 008	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 009	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 010	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 011	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 012	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 013	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 014	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 015	0071907		RESISTOR 220 OHM 1/4W 10% COMP	AB	RCR07G221KS
R 016	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 017	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 018	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 019	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 020	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 021	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 022	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 023	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 024	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 025	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 026	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 027	0072189		RESISTOR 1.0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 028	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 029	0078600		NOT ASSIGNED		
R 030	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 031	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 032	0078600		NOT ASSIGNED		
R 033	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 034	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 035	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 036	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 037	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 038	0072077		RESISTOR 47K OHM 1/4W 10% COMP	AB	RCR07G473KS
R 040	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO SWITCH/AGC PWB ASSEMBLY - continued
153202

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 041	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 042	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 043	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 044	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 045	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 046	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 047	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 048	0089010		RESISTOR 2.7 OHM 1/4W 5% NICKEL FILM		
R 049	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 050	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 051	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 052	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 053	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 054	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 055	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 056	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 057	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 058	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 059	0071918		RESISTOR 330 OHM 1/4W 10% COMP	AB	RCR07G331KS
R 060	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 061	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 062	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 063	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 064	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 065	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 066	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 067	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 068	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 069	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 070	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 071	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 072	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 073	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 074	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 075	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 076	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 077	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 078	0072189		RESISTOR 1.0 MEG 1/4W 10% COMP	AB	RCR07G105KS
R 079	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 080	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 081	0089110		RESISTOR 39K OHM 1/4W 5% CARBON FILM		
R 082	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 083	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 084	0078600		NOT ASSIGNED		
R 085	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 086	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 087	0089082		RESISTOR 2.7K OHM 1/4W 5% CARBON FILM		
R 088	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		

PARTS LIST
VIDEO SWITCH/AGC PWB ASSEMBLY - continued
153202

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 089	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 090	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 091	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 092	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 093	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 094	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 095	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 096	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 097	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 098	0086223		POT 25K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR25K
R 099	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 100	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 101	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 102	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 103	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 104	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 105	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 106	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 107	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 108	0071887		RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
R 109	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 110	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 111	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 112	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 113	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROH	R-25 BY DESCRIPTON
R 114	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 115	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		
R 116	0086223		POT 25K OHM 1/2W CER 1/4 DIA VERT ADJ	H	62PR25K
R 117	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 118	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 119	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 120	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 121	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 122	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 124	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 125	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 125	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 126	0078600		NOT ASSIGNED		
R 127	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 128	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 129	0072198		RESISTOR 1.5 MEG 1/4W 10% COMP	AB	RCR07G155KS
R 130	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 131	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 132	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
U 001	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N
U 002	0083623		IC CMOS MULTI MONO RETRIG DUAL	MOS	MC14528BCL
U 003	0084890		IC OP AMP 8L-DIP 70C COMP 741C	MOS	MC1741CP1
U 004	0081901		IC OP AMP JFET 8L-TO39 85C COMP	NSC	LH0042CH
U 005	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A

PARTS LIST
AUDIO SWITCH OPTION PWB ASSEMBLY
162606

REF DESIG	PART NO.	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0162607	PWB AUDIO SWITCHING OPTION 6350		
003	0072329	SCREW 4-40 X 7/16 PAN HD,SST	XZ	PER MS51957-16
004	0073265	WASHER NO. 4 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
005	0071494	NUT 4-40 UNC-2B,PLAIN-HEX,SST	XZ	PER MS35649-244
C 001	0081101	CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 002	0081101	CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 003	0079975	CAPACITR .047 MF 200V CER MONO -20%+80%	ER	8131-200-651-473Z
C 004	0079975	CAPACITR .047 MF 200V CER MONO -20%+80%	ER	8131-200-651-473Z
C 005	0083114	CAPACITR 750 PF 100V SILVER MICA 2%	SGC	D151F751G03
C 006	0081157	CAPACITR .22 MF 50V CER MONO X7R 20%	ER	8131-050-X7R-224M
C 007	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 008	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 009	0080148	CAPACITR 10 MF 20V SOLID TANT POL 20%	KEM	T362B106M020AS
C 010	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 011	0081210	CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 012	0081210	CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
CR001	0078763	DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR002	0078763	DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR003	0078763	DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR004	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR007	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
J 001	0086938	CONNECTR 12 PIN SINGLE READOUT	ABE	143-012-03-1130
R 001	0075632	RESISTOR 390 OHM 1W 10% COMP	AB	RCR32G391KS
R 002	0078924	RESISTOR 20.0K OHM RN55C 1% MTL FLM	DP	RN55C2002F
R 003	0078924	RESISTOR 20.0K OHM RN55C 1% MTL FLM	DP	RN55C2002F
R 004	0078924	RESISTOR 20.0K OHM RN55C 1% MTL FLM	DP	RN55C2002F
R 005	0078924	RESISTOR 20.0K OHM RN55C 1% MTL FLM	DP	RN55C2002F
R 006	0082313	POT 1K OHM .2W COMP .39 DIA HORIZ ADJ	PIH	PT10H
R 007	0071887	RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
R 008	0078928	RESISTOR 100K OHM RN55C 1% MTL FLM	DP	RN55C1003F
R 009	0072077	RESISTOR 47K OHM 1/4W 10% COMP	AB	RCR07G473KS
R 010	0072054	RESISTOR 22K OHM 1/4W 10% COMP	AB	RCR07G223KS
R 011	0072123	RESISTOR 150K OHM 1/4W 10% COMP	AB	RCR07G154KS
R 012	0072059	RESISTOR 27K OHM 1/4W 10% COMP	AB	RCR07G273KS
R 013	0072123	RESISTOR 150K OHM 1/4W 10% COMP	AB	RCR07G154KS
R 014	0078933	RESISTOR 10.0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 015	0078933	RESISTOR 10.0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 016	0078933	RESISTOR 10.0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 017	0078933	RESISTOR 10.0K OHM RN55C 1% MTL FLM	DP	RN55C1002F
R 018	0082313	POT 1K OHM .2W COMP .39 DIA HORIZ ADJ	PIH	PT10H
R 019	0071887	RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
R 020	0072113	RESISTOR 100K OHM 1/4W 10% COMP	AB	RCR07G104KS
R 021	0071951	RESISTOR 1.0K OHM 1/4W 10% COMP	AB	RCR07G102KS
R 022	0072123	RESISTOR 150K OHM 1/4W 10% COMP	AB	RCR07G154KS
R 023	0072059	RESISTOR 27K OHM 1/4W 10% COMP	AB	RCR07G273KS
R 024	0072165	RESISTOR 470K OHM 1/4W 10% COMP	AB	RCR07G474KS
U 001	0081840	IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N
U 002	0083017	IC CMOS GATE NOR 2-IN QUAD	MOS	MC14001BCL
U 003	0086939	IC PMOS ANALOG SW SPDT 8L-DIP	TI	TL607P

PARTS LIST
AUDIO MODULATION LIMITTER PWB ASSEMBLY
153189

REF DESIG	PART NO.	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0106044	COVER DIPEXER		
002	0077506	SCREW 2-56 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
003	0086662	JUMPER FLAT CABLE 6-COND FLEXIBLE	AMP	86942-5
004	0105231	PIN CONNECTOR		
005	0153188	PWB AUDIO MOD,LIMITER		
C 001	0035654	CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 002	0035654	CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 003	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0080139	CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
CR001	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR002	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR004	0071142	DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0078696	DIODE 1N746A SI ZEN 3.3V 5% .4W	TI	1N746A
Q 001	0077148	TRANSSTR 2N3251 PNP SIL	MOS	2N3251
R 001	0072039	RESISTOR 15K OHM 1/4W 10% COMP	AB	RCR07G153KS
R 002	0072026	RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 003	0077524	RESISTOR 75 OHM 1/4W 5% COMP	AB	RCR07G750JS
R 004	0077524	RESISTOR 75 OHM 1/4W 5% COMP	AB	RCR07G750JS
R 005	0084085	RESISTOR 16.5K OHM RN55C 1% MTL FLM	DP	RN55C1652F
R 006	0072019	RESISTOR 8.2K OHM 1/4W 10% COMP	AB	RCR07G822KS
R 007	0084085	RESISTOR 16.5K OHM RN55C 1% MTL FLM	DP	RN55C1652F
R 008	0084085	RESISTOR 16.5K OHM RN55C 1% MTL FLM	DP	RN55C1652F
R 009	0084166	RESISTOR 8.25K OHM RN55C 1% MTL FLM	DP	RN55C8251F
R 010	0086663	RESISTOR 57.6K OHM RN55C 1% MTL FLM	DP	RN55C5762F
R 011	0072019	RESISTOR 8.2K OHM 1/4W 10% COMP	AB	RCR07G822KS
R 012	0072159	RESISTOR 390K OHM 1/4W 10% COMP	AB	RCR07G394KS
R 013	0071836	RESISTOR 10 OHM 1/4W 10% COMP	AB	RCR07G100KS
R 014	0071993	RESISTOR 3.9K OHM 1/4W 10% COMP	AB	RCR07G392KS
R 015	0072064	RESISTOR 33K OHM 1/4W 10% COMP	AB	RCR07G333KS
R 016	0072116	RESISTOR 120K OHM 1/4W 10% COMP	AB	RCR07G124KS
R 017	0071887	RESISTOR 100 OHM 1/4W 10% COMP	AB	RCR07G101KS
U 001	0088019	IC OP AMP 8L-DIP 125C TRANSCNDUCTNCE	RCA	CA3080E
U 002	0086218	IC OP AMP 14L-DIP 125C COMP QUAD 741	TI	RC4136N

PARTS LIST
DC CONVERTER PWB ASSEMBLY
156982

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
001	0156981		PWB DC CONVERTER		
006	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
007	0143198		WASHER .208ID FLAT FIBER .500 OD .062THK	XZ	PER SA DWG 143198
008	0156982WPC		WIREPREP DC CONVERTER		
009	0156982PPC		PREFORM DC CONVERTER		
010	0229817		ASSY DC CONVERTER AUTO INSERTION		
011	0078140		TUBING TEFLON AWG20 NATURL .034ID .058OD	SH	7702-20-115
011	0078140		TUBING TEFLON AWG20 NATURL .034ID .058OD	SH	7702-20-115
018	0078140		TUBING TEFLON AWG20 NATURL .034ID .058OD	SH	7702-20-115
C 001	0075217		CAPACITR 10 MF 50V	SP	500D106G050CB7
C 002	0070552		CAPACITR .002 MF 1KV CER DISC Z5U 20%	CRL	DD202
C 003	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0075217		CAPACITR 10 MF 50V	SP	500D106G050CB7
C 005	0087781		CAPACITR 100 MF 50V	SP	672D107H050DT5J
C 006	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 007	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 008	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 009	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 010	0070682		CAPACITR 2000 MF 25V	CD	BR2000 25
C 011	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 012	0081095		CAPACITR 3.3 MF 50V CER MONO 20%	ER	8151-050-651-335M
CR001	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR002	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR003	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR004	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR005	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR005	0082208		DIODE MR504 SIL 400V 3A	MOS	MR504
CR006	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR007	0071122		DIODE 1N914 SIL 75V 75MA	SY	1N914
CR008	0085154		DIODE MR854 SIL 400V 3A FAST REC.	MOS	MR854
CR009	0085154		DIODE MR854 SIL 400V 3A FAST REC.	MOS	MR854
Q 001	0078851		TRANSSTR 2N2905 PNP SIL	MOS	2N2905
Q 002	0078851		TRANSSTR 2N2905 PNP SIL	MOS	2N2905
R 001	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 002	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 003	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M
R 004	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 005	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089118		RESISTOR 82K OHM 1/4W 5% CARBON FILM		
R 007	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 008	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 009	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 010	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 011	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 012	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV5021
R 013	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 014	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		

PARTS LIST
DC CONVERTER PWB ASSEMBLY - continued
156982

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 015	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 016	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 017	0089095		RESISTOR 9.1K OHM 1/4W 5% CARBON FILM		
R 018	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 019	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 020	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 021	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 022	0071932		RESISTOR 560 OHM 1/2W 10% COMP	AB	RCR20G561KS
R 023	0089050		RESISTOR 120 OHM 1/4W 5% CARBON FILM		
R 024	0089050		RESISTOR 120 OHM 1/4W 5% CARBON FILM		
R 025	0071932		RESISTOR 560 OHM 1/2W 10% COMP	AB	RCR20G561KS
R 026	0071868		RESISTOR 50 OHM 5W WW 5%	TO	VAL5
R 027	0035754		RESISTOR .20 OHM 2W WW 10%	CBR	CW2
R 028	0071868		RESISTOR 50 OHM 5W WW 5%	TO	VAL5
R 029	0071954		RESISTOR 1.0K OHM 1/2W 10% COMP	AB	RCR20G102KS
R 030	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
S 001	0076626		SWITCH TOG SPDT AC 5A @ 115V	AEP	MTA-106D
U 001	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N
U 002	0086509		IC VLTG RGLTR SWITCHING 70C 16L-DIP	MOS	MC3420P
U 003	0083237		IC VLTG RGLTR NEG 15V 0.5A TYP TO220	MOS	MC7915CT

PARTS LIST
AUXILIARY IF-AGC PWB ASSEMBLY
162612

REF DESIG	PART NO.	PC RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0162612WPC		C		
001	0162611		PWB IFAGC		
002	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
C 001	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 002	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 003	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 006	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 008	0170666		CAPACITR 2-8 PF MIN CER DISC PC MT	ER	538-037-A 2-8
C 009	0170667		CAPACITR 5.5-18 PF MIN CER DISC PC MT	ER	538-037-A 5.5-18
C 010	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 011	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 012	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 013	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 014	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 015	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 016	0170668		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-037-D 9-35
C 017	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 018	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 019	0170669		CAPACITR 15-60 PF MIN CER DISC PC MT	ER	538-037-F 15-60
C 020	0082952		CAPACITR 220 PF 1KV CER DISC 75F 10%	CRL	DD-221
C 021	0079975		CAPACITR .047 MF 200V CER MONO -20%+80%	ER	8131-200-651-473Z
C 022	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 023	0076697		CAPACITR 2.2 MF 20V SOLID TANT POL 10%	SP	150D225X9020A2
CR001	0086179		DIODE UM9301 PIN DIODE	UNC	UM9301
CR002	0086179		DIODE UM9301 PIN DIODE	UNC	UM9301
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR004	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0078714		DIODE 1N4744A SI ZEN 15V 5% 1W	MOS	1N4744A
E 001	0081056		CORE HEAD FERRITE TO .138X.063X.128L	STK	57-0058
J 001	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
J 002	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
L 001	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0077954		INDUCTOR .47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0079167		INDUCTOR .33 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 002	0085042		TRANSSTR MRF 517 NPN SIL	MOS	MRF 517
Q 003	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 001	0078056		RESISTOR 100 OHM 1/8W 5% COMP	AB	RCR05G101JS
R 002	0079933		RESISTOR 1.5K OHM 1/8W 5% COMP	AB	RCR05G152JS

PARTS LIST
AUXILIARY IF-AGC PWB ASSEMBLY - continued
162612

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 003	0087113		RESISTOR 6.8 OHM 1/8W 5% COMP	AB	RCR05GCR8JS
R 004	0089042		RESISTOR 56 OHM 1/4W 5% CARBON FILM		
R 005	0087114		RESISTOR 8.2K OHM 1/8W 5% COMP	AB	RCR05G822JS
R 006	0078053		RESISTOR 47 OHM 1/8W 5% COMP	AB	RCR05G470JS
R 007	0078062		RESISTOR 470 OHM 1/8W 5% COMP	AB	RCR05G471JS
R 008	0078071		RESISTOR 5.6K OHM 1/8W 5% COMP	AB	RCR05G562JS
R 009	0078069		RESISTOR 3.9K OHM 1/8W 5% COMP	AB	RCR05G392JS
R 010	0078065		RESISTOR 1.0K OHM 1/8W 5% COMP	AB	RCR05G102JS
R 011	0075624		RESISTOR 270 OHM 1/4W 5% COMP	AB	RCR07G271JS
R 013	0078207		RESISTOR 2.2K OHM 1/8W 5% COMP	AB	RCR05G222JS
R 014	0083925		RESISTOR 22.6K OHM RN55C 1% MTL FILM	DP	RN55C2262F
R 015	0078241		RESISTOR 19.6K OHM RN60C 1% MTL FILM	DP	RN60C1962F
R 016	0078646		RESISTOR 6.8K OHM 1/8W 5% COMP	AB	RCR05G682JS
R 017	0078068		RESISTOR 3.3K OHM 1/8W 5% COMP	AB	RCR05G332JS
R 018	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 019	0078207		RESISTOR 2.2K OHM 1/8W 5% COMP	AB	RCR05G222JS
R 020	0079932		RESISTOR 100K OHM 1/8W 5% COMP	AB	RCR05G104JS
R 021	0078207		RESISTOR 2.2K OHM 1/8W 5% COMP	AB	RCR05G222JS
R 022	0078208		RESISTOR 10K OHM 1/8W 5% COMP	AB	RCR05G103JS
R 023	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 024	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 025	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 026	0078062		RESISTOR 470 OHM 1/8W 5% COMP	AB	RCR05G471JS
R 027	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 028	0078208		RESISTOR 10K OHM 1/8W 5% COMP	AB	RCR05G103JS
R 029	0078070		RESISTOR 4.7K OHM 1/8W 5% COMP	AB	RCR05G472JS
R 030	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
U 001	0082382		IC AMPL CASCODE RF/IF DIFF IN 10L=TO100	MOS	MC1550G
U 002	0082317		IC AMPL/DETECTOR VIDEO 8L=DIP	MOS	MC1330P
U 003	0082380		IC TV SIGNAL PROCESSOR	MOS	MC1344P
W 005	0170685		JUMPER INSULATED BODY .100 IN. LONG T&R	TEV	WL 20
W 005	0170685		JUMPER INSULATED BODY .100 IN. LONG T&R	TEV	WL 20
W 005	0230892		WIRE 22 GA WHITE BUSCH TINNED		

PARTS LIST
SOLID-STATE SWITCH MODULE ASSEMBLY
36595

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036595WFA		WIRE PREP FOR SOLID STATE SWITCH MODULE		
	0036598		SOLID STATE SWITCH SCHEM DIAG		
001	0036597		ASSY SOLID STATE SWITCH PC BOARD		
002	0036132		HOUSING SOLID STATE SWITCH		
003	0073012		TERMINAL GND INT TOOTH NO4 ANGLED	SH	1416-4
004	0072309		SCREW 4-40 X 3/16 PAN HD,SST	XZ	PER MS51957-12
005	0076877		NUT 3/8-32 HEX,POT MTG,BRASS,NI PLT	BIR	6337
006	0153276		SILKSCREEN TOP COVER SOLID STATE SWITCH		
007	0036134		BOT COVER SOLID STAE SWITCH		
008	0072347		SCREW 6 X 1/4 PAN HD,TYPE A OR AB,CAD PL	XZ	PER ANSI B18.6.4-1966
010	0078600		NOT ASSIGNED		
011	0078600		NOT ASSIGNED		
012	0062078		SPACER SOLID STATE SWITCH		
014	0076333		POT HARDWARE WASHER 3/8 LOCK INT TOOTH	AB	H-2898
C 019	0077863		CAPACITR .001 MF 500V FDTHRU THD GMV	SPU	54-804-002-102P
C 020	0077863		CAPACITR .001 MF 500V FDTHRU THD GMV	SPU	54-804-002-102P
C 021	0077863		CAPACITR .001 MF 500V FDTHRU THD GMV	SPU	54-804-002-102P

PARTS LIST
SOLID-STATE SWITCH PWB ASSEMBLY
36597

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036597WPC		WIRE PREP FOR SOLID STATE SWITCH PCB		
001	0036596		SOLID STATE SWITCH PC BD		
002	0073318		WIRE 22 BUS	BM	8021
003	0230892		WIRE 22 GA WHITE BUNCH TINNED		
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 006	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 007	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 008	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 009	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 010	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 011	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 012	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 014	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 015	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 016	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR002	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR003	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR004	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR005	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR006	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR007	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
CR008	0071142		DIODE 1N4154 STL 25V 150MA	SY	1N4154
J 001	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
J 002	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
J 003	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
L 001	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0078046		INDUCTOR 3.3 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 003	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 004	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 001	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 002	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 003	0089106		RESISTOR 27K OHM 1/4W 5% CARBON FILM		
R 004	0089106		RESISTOR 27K OHM 1/4W 5% CARBON FILM		
R 005	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 006	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 007	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 008	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 009	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 010	0089106		RESISTOR 27K OHM 1/4W 5% CARBON FILM		
R 011	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 012	0089106		RESISTOR 27K OHM 1/4W 5% CARBON FILM		
R 013	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 014	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 015	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 016	0089108		RESISTOR 33K OHM 1/4W 5% CARBON FILM		
R 017	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		

PARTS LIST
PHASE LOCK MODULE ASSEMBLY
36175

REF DESIG	PART NO.	FN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036178		PHASE LOCK SERVO SCHEM DIAG		
001	0036177		ASSY PHASE LOCK SERVO PC BD		
002	0116547		MODULE CASTING		
003	0036179		FRONT PANEL PHASE LOCK SERVO		
003	0073045		CABLE TIE - MINIATURE - 4 IN. LONG	PAN	SST1M
004	0036250		COVER MODULE		
005	0077322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500		MODULE HANDLE PLASTIC "I"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
010	0077871		CLIP DATALAMP CARTRIDGE MTG	DI	515-0051
011	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
012	0073268		WASHER NO. 6 LOCK, SPLIT, CAD PLT STL	XZ	ANSI B18.21.1
DS001	0082384		LAMP LED YEL CRTDG W/YEL LENS 5V 20MA	DI	507-4757-3333-500

PARTS LIST
PHASE LOCK SERVO PWB ASSEMBLY
36177

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0036177PPC		PREFORM FOR PHASE LOCKED SERVO 6150		
	0036177WPC		WIRE PREP FOR PHASE LOCKED SERVO 6150		
001	0036176		PHASE LOCK SERVO PC BD		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0079335		PAD TRANSSTR TO5 & TO18 TO TO5	THC	7717-44-DAP
015	0229981		ASSY PHASE LOCK SERVO AUTO INSERTION		
C 001	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0077655		CAPACITR 20 PF 500V SILVER MICA 5%	CD	CD6CD200J03
C 004	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 005	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 006	0073491		CAPACITR 12 PF 500V SILVER MICA 5%	CD	CD15CD120J03
C 007	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COKO-209C
C 008	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COKO-209C
C 009	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 010	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
C 011	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
C 012	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 013	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 014	0073495		CAPACITR 39 PF 500V SILVER MICA 5%	CD	CD15ED390J03
C 015	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 016	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 017	0077366		CAPACITR 10 PF 500V SILVER MICA 10%	CD	CD6CD100K03
C 018	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 020	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COKO-109C
C 021	0077366		CAPACITR 10 PF 500V SILVER MICA 10%	CD	CD6CD100K03
C 022	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 023	0077390		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD6ED270J03
C 024	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 025	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 026	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 027	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 028	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 029	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 030	0070519		CAPACITR 120 PF 500V SILVER MICA 5%	CD	CD15FD121J03
C 031	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 032	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 033	0073497		CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 034	0081867		CAPACITR 470 PF 100V CER DISC X5F 10%	ER	831-000-X5F0-471K
C 035	0080142		CAPACITR 20 PF 500V SILVER MICA 5%	CD	CD15ED200J03
C 036	0073497		CAPACITR 180 PF 500V SILVER MICA 5%	CD	CD15FD181J03
C 037	0081867		CAPACITR 470 PF 100V CER DISC X5F 10%	ER	831-000-X5F0-471K
C 038	0080142		CAPACITR 20 PF 500V SILVER MICA 5%	CD	CD15ED200J03
C 039	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 040	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M
C 041	0082262		CAPACITR .033 MF 50V CER MONO 20%	ER	8121-050-651-333M
C 042	0081098		CAPACITR .47 MF 50V CER MONO 20%	ER	8131-050-651-474M
C 044	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 045	0081101		CAPACITR 1 MF 50V CER MONO 20%	ER	8131-050-651-105M

PARTS LIST
PHASE LOCK SERVO PWB ASSEMBLY - continued
36177

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 046	0070564		CAPACITR .01 MF 100V POLYESTER 10%	CD	WMF1S1E
C 047	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 048	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 049	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 050	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 051	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 052	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 053	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 054	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 055	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 056	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 057	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 059	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 060	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 061	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 062	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 064	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 065	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 066	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 067	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 068	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 069	0075417		CAPACITR .01 MF 150V CER DISC Z5V-40+60%	CRL	DDM-103
C 070	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 071	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 072	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
CR001	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR005	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR007	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR008	0078696		DIODE 1N746A SI ZEN 3.3V 5% .4W	TI	1N746A
L 001	0079168		INDUCTOR .68 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079167		INDUCTOR .33 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 006	0035986		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
L 007	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 009	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 010	0035986		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
L 011	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 013	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 014	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 015	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
PHASE LOCK SERVO PWB ASSEMBLY - continued
36177

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 016	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 017	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 018	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 019	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 020	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 021	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 022	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 023	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 024	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 025	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 026	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0076446		TRANSSTR 2N4222 FET N-CHNL JUNC	MOS	2N4222
Q 004	0079560		TRANSSTR 2N4093 FET N-CHNL JUNC	MOS	2N4093
Q 005	0077148		TRANSSTR 2N3251 PNP SIL	MOS	2N3251
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0073140		TRANSSTR 2N2270 NPN SIL	RCA	2N2270
R 001	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 002	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 003	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 004	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 005	0089045		RESISTOR 75 OHM 1/4W 5% CARBON FILM		
R 006	0071993		RESISTOR 3.9K OHM 1/4W 10% COMP	AB	RCR07G392KS
R 007	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 008	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 009	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 010	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 011	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 012	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 013	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 014	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 015	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 016	0089038		RESISTOR 39 OHM 1/4W 5% CARBON FILM		
R 017	0089038		RESISTOR 39 OHM 1/4W 5% CARBON FILM		
R 018	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 019	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 020	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 021	0089126		RESISTOR 180K OHM 1/4W 5% CARBON FILM		
R 022	0072026		RESISTOR 10K OHM 1/4W 10% COMP	AB	RCR07G103KS
R 023	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 024	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 025	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 026	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 027	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 028	0089126		RESISTOR 180K OHM 1/4W 5% CARBON FILM		
R 029	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 030	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M

PARTS LIST
PHASE LOCK SERVO PWB ASSEMBLY - continued
36177

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 031	0081674		POT 1K OHM 1/4W COMP 1/2 DIA VERT ADJ	AB	YR102M
R 032	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 033	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 034	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 035	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 036	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 037	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 038	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 039	0089094		RESISTOR 8.2K OHM 1/4W 5% CARBON FILM		
R 040	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 041	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 042	0089134		RESISTOR 390K OHM 1/4W 5% CARBON FILM		
R 043	0089134		RESISTOR 390K OHM 1/4W 5% CARBON FILM		
R 044	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 045	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 046	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 047	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 048	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 049	0089124		RESISTOR 150K OHM 1/4W 5% CARBON FILM		
R 050	0089124		RESISTOR 150K OHM 1/4W 5% CARBON FILM		
R 051	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 052	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 053	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 054	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 055	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 056	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 057	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 058	0089128		RESISTOR 220K OHM 1/4W 5% CARBON FILM		
R 059	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 060	0089138		RESISTOR 560K OHM 1/4W 5% CARBON FILM		
R 061	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 062	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 063	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 064	0071939		RESISTOR 680 OHM 1/2W 10% COMP	AB	RCR20G681KS
R 065	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 066	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 067	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 068	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 069	0072113		RESISTOR 100K OHM 1/4W 10% COMP	AB	RCR07G104KS
R 070	0089112		RESISTOR 47K OHM 1/4W 5% CARBON FILM		
R 071	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 072	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 073	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 074	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 075	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 076	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 077	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 078	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
T 001	0123462		TRANSFORMER SPLITTER 1T,2T		
T 002	0231979		TRANSFORMER TRIFILIAR W/O CENTER TAP		PER SA SPEC 231979

PARTS LIST
PHASE LOCK SERVO PWB ASSEMBLY - continued
36177

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
T 003	0231979		TRANSFORMER TRIFILIAR W/O CENTER TAP		PER SA SPEC 231979
U 001	0082382		IC AMPL CASCODE RF/IF DIFF IN 10L-TO100	MOS	MC1550G
U 002	0082382		IC AMPL CASCODE RF/IF DIFF IN 10L-TO100	MOS	MC1550G
U 003	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P
U 004	0081100		IC DIODE ARRAY 2+1 QUAD 10L-T05	RCA	CA3019
U 005	0081100		IC DIODE ARRAY 2+1 QUAD 10L-T05	RCA	CA3019
U 006	0170540		IC OP AMP 14L-DIP 70C UNCOMP DUAL 709C	MOS	MC1437P
U 007	0082566		IC COMPARATOR-VOLTAGE 14L-DIP QUAD	MOS	MC3302P
U 008	0082316		IC HNIL GATE NAND 2-IN QUAD	TI	SN15324N
U 009	0081840		IC OP AMP 8L-DIP 70C COMP DUAL 741C	NSC	LM1458N
W 008	0073318		WIRE 22 BUS	BM	8021
W 009	0073318		WIRE 22 BUS	BM	8021
W 010	0073318		WIRE 22 BUS	BM	8021
W 011	0073318		WIRE 22 BUS	BM	8021
W 012	0073318		WIRE 22 BUS	BM	8021
W 013	0073318		WIRE 22 BUS	BM	8021
W 014	0073318		WIRE 22 BUS	BM	8021
W 015	0073318		WIRE 22 BUS	BM	8021
W 016	0073318		WIRE 22 BUS	BM	8021
W 017	0073318		WIRE 22 BUS	BM	8021

PARTS LIST
PHASE LOCK LOW-BAND OUTPUT CONVERTER LO PWB ASSEMBLY, CHANNEL 2
231502

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
A 001	0231080		COMMON PARTS PHASE LOCK LO LOW CH 2-6		
A 002	0231502WPC		PHASE LOCK LO LOW BAND WIRE LIST CH 2-6		
A 003	0231502PPC		PHASE LOCK LO LOW BAND PC PREFORM CH 2-6		
C 006	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 007	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 008	0070509		CAPACITR 68 PF 500V SILVER MICA 5%	CD	CD15ED680J03
C 010	0073493		CAPACITR 18 PF 500V SILVER MICA 5%	CD	CD15CD180J03
C 012	0070487		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD15ED270J03
C 026	0070498		CAPACITR 47 PF 500V SILVER MICA 5%	CD	CD15ED470J03
CR001	0078763		DIODE 1N4740A SI ZEN 10V 5% 1W	MOS	1N4740A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR008	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR010	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR011	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR012	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
L 001	0078600		NOT ASSIGNED		
L 009	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
L 011	0078600		NOT ASSIGNED		
L 027	0077971		INDUCTOR 1.5 UH SUBMIN UNSHLD 10%	DP	IR-2
R 001	0089090		RESISTOR 5.6K OHM 1/4W 5% CARBON FILM		
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 003	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 025	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 045	0071932		RESISTOR 560 OHM 1/2W 10% COMP	AB	RCR20G561KS
R 051	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
W 001	0230927		CABLE INTERCONNECTING 7.50 IN.		
W 002	0230929		CABLE INTERCONNECTING 9.00 IN.		
W 003	0230922		CABLE INTERCONNECTING 4.50 IN.		
W 004	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
W 005	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
W 006	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
W 007	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
W 008	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
W 010	0073318		WIRE 22 BUS	BM	8021
Y 001	0082574		CRYSTAL 50.5250 MHZ .0025% PARALLEL RES	ERT	HC-18/U HOLDER

PARTS LIST
PHASE LOCK LOW-BAND OUTPUT CONVERTER LO PWB ASSEMBLY, CHANNELS 2-6 COMMON PARTS
231080

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0125764		SHIELD PHASE LOCK		
004	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
005	0036260		ASSY PHASE LOCK LO LOW BAND AUTO-INSERT		
C 001	0070531		CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 004	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 005	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 009	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 011	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 013	0070531		CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 014	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 015	0070531		CAPACITR 270 PF 500V SILVER MICA 5%	CD	CD15FD271J03
C 016	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 017	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 018	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 019	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 020	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 021	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 022	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-809C
C 023	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 024	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 025	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 027	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 028	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 029	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 030	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 031	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 032	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 033	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 034	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 035	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 036	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 037	0077366		CAPACITR 10 PF 500V SILVER MICA 10%	CD	CD6CD100K03
C 038	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 039	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 040	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 041	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 042	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 043	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 044	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 045	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 046	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 047	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 048	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 049	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 050	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 051	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 052	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G

PARTS LIST
PHASE LOCK LOW-BAND OUTPUT CONVERTER LO PWB ASSEMBLY, CHANNELS 2-6 COMMON PARTS
231080- continued

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 031	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV5021
T 001	0123462		TRANSFORMER SPLITTER 1T,2T		
T 002	0123038		TRANSFORMER BALANCED MIXER		
T 003	0123038		TRANSFORMER BALANCED MIXER		
U 001	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 002	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P
W 001	0230927		CABLE INTERCONNECTING 7.50 IN.		
W 002	0230929		CABLE INTERCONNECTING 9.00 IN.		
W 003	0230922		CABLE INTERCONNECTING 4.50 IN.		

PARTS LIST
PHASE LOCK LOW-BAND OUTPUT CONVERTER PWB
ASSEMBLY, CHANNELS 3 THROUGH 6,
231503-231506

Note

Components C6, C7, C8, C10, C12, C20, C26, L9, R3, and Y1 vary according to channel; refer to the schematic diagram, figure 8-46, for those values.

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS 7-13
231081

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0125764		SHIELD PHASE LOCK		
004	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
005	0036261		ASSY PHASE LOCK LO HI BAND AUTO-INSERT		
C 001	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0078600		NOT ASSIGNED		
C 004	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 005	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 008	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 009	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJ0-229C
C 011	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 016	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJ0-229C
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 019	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 020	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 021	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 022	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 023	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 024	0081924		CAPACITR 7.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-709C
C 025	0081924		CAPACITR 7.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-709C
C 027	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 028	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 029	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 030	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 031	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 033	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 034	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 035	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-409C
C 036	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 037	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 038	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 039	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 040	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 041	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 042	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 043	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 044	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 045	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 046	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 047	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 048	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 049	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 050	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 051	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 052	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 053	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS 7-13 - continued
231081

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 054	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 055	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 056	0035641		CAPACITR 2-9 PF MIN PC MT	AE	MT10KA/29
C 057	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 059	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 060	0077390		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD6ED270J03
C 061	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 062	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 064	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 065	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 066	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 067	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 068	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 069	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 070	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 071	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 072	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 073	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 074	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 075	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 076	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 077	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 078	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 079	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 080	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 081	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
CR004	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 003	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
L 002	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 003	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 004	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 005	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 006	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 007	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 009	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 010	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 011	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 012	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 013	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 014	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 015	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 016	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS 7-13 - continued
231081

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 019	0035986		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
L 028	0078600		NOT ASSIGNED		
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 003	0082319		TRANSSTR MFE-121 MOSFET DUAL GATE	MOS	MFE 121
Q 004	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 022	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 025	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 034	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	8V5021
R 049	0089054		RESISTOR 180 OHM 1/4W 5% CARBON FILM		
T 001	0129603		TRANSFORMER TRIFILAR 0-3 CORE		
T 002	0123462		TRANSFORMER SPLITTER 1T,2T		
T 003	0123038		TRANSFORMER BALANCED MIXER		
T 004	0123038		TRANSFORMER BALANCED MIXER		
U 001	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A
U 002	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 003	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P

Note

The following components vary according to channel: C6, C7, C10, C14, C18, C26, C36, CR1, L1, L8, and Y1. Refer to the chart on the schematic diagram, figure 8-48, for the channel unique parts for channels 7-13.

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS A-I
231082

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0125764		SHIELD PHASE LOCK		
004	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
005	0036261		ASSY PHASE LOCK LO HI BAND AUTO-INSERT		
006	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
007	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
008	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
009	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
010	0073442		WIRE 22 SOLID WHITE 600V 105C	THM	PER MIL-W-76B TYPE MW
011	0073318		WIRE 22 BUS	BM	8021
C 001	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0078600		NOT ASSIGNED		
C 004	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 005	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 008	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 009	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJ0-229C
C 011	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 016	0081971		CAPACITR 2.2 PF 100V CER DISC COJ +-.25P	ER	835-024-COJ0-229C
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 019	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 020	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 021	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 022	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 023	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 024	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 025	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 026	0073491		CAPACITR 12 PF 500V SILVER MICA 5%	CD	CD15CD120J03
C 027	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 028	0073491		CAPACITR 12 PF 500V SILVER MICA 5%	CD	CD15CD120J03
C 029	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 030	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 031	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 033	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 034	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 035	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-409C
C 036	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 037	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 038	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 039	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 040	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 041	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 042	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 043	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 044	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 045	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 046	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 047	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 048	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS A-I - continued
231082

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 049	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 050	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 051	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 052	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 053	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 054	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 055	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 056	0035641		CAPACITR 2-9 PF MIN PC MT	AE	MT10KA/29
C 057	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 059	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 060	0077390		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD6ED270J03
C 061	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 062	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 064	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 065	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 066	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 067	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 068	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 069	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 070	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 071	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 072	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 073	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 074	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 075	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 076	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 077	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 078	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 079	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 080	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 081	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0076524		DIODE 1N752A SI ZEN 5.6V 5% .4W	MOS	1N752A
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
CR004	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
F 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
F 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
F 003	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
L 002	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 003	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 004	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 005	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 006	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 007	0082435		INDUCTOR .1 UH SUBMIN UNSHLD 3%	DP	IR-2
L 010	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 011	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS A-I - continued
231082

PART# 0231082 DESCRIPTION: COMMON PARTS PHASE LOCK LO HIGH A-I

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 012	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 013	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 014	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 015	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 016	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 019	0035986		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
L 028	0078600		NOT ASSIGNED		
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 003	0082319		TRANSSTR MFE-121 MOSFET DUAL GATE	MOS	MFE 121
Q 004	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 022	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 025	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 034	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV5021
R 049	0089054		RESISTOR 180 OHM 1/4W 5% CARBON FILM		
T 001	0129603		TRANSFORMER TRIFILAR 0-3 CORE		
T 002	0123462		TRANSFORMER SPLITTER 1T,2T		
T 003	0123038		TRANSFORMER BALANCED MIXER		
T 004	0123038		TRANSFORMER BALANCED MIXER		
U 001	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A
U 002	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 003	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS J - O
231083

REF DESIG	PART NO.	EN KV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0125764		SHIELD PHASE LOCK		
004	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
005	0036261		ASSY PHASE LOCK LO HI BAND AUTO-INSERT		
006	0230892		WIRE 22 GA WHITE BUNCH TINNED		
007	0230892		WIRE 22 GA WHITE BUNCH TINNED		
008	0230892		WIRE 22 GA WHITE BUNCH TINNED		
009	0230892		WIRE 22 GA WHITE BUNCH TINNED		
010	0230892		WIRE 22 GA WHITE BUNCH TINNED		
011	0073318		WIRE 22 BUS	BM	8021
C 001	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0078600		NOT ASSIGNED		
C 004	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	TPT	831-000-P3K0-150M
C 005	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	TPT	831-000-P3K0-150M
C 008	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 019	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 020	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 021	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 022	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-209C
C 023	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-209C
C 024	0079799		CAPACITR 7 PF 500V SILVER MICA 10%	CD	CD15CD070K03
C 025	0079799		CAPACITR 7 PF 500V SILVER MICA 10%	CD	CD15CD070K03
C 026	0073492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 027	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 028	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 029	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 030	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 031	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 033	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 034	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 035	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-409C
C 036	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 037	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 038	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 039	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 040	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 041	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 042	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 043	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 044	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-009
C 045	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-109C
C 046	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-109C
C 047	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-009
C 048	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 049	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS J - O - continued
231083

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 050	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 051	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 052	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 053	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 054	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 055	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 056	0035641		CAPACITR 2-9 PF MIN PC MT	AE	MT10KA/29
C 057	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 059	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 060	0077390		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD6ED270J03
C 061	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 062	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 064	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 065	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 066	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 067	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 068	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 069	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 070	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 071	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 072	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 073	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 074	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 075	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 076	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 077	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 078	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 079	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 080	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 081	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
CR004	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 003	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
L 002	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 003	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 004	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 005	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 006	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 007	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 009	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS J - O - continued
231083

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 011	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 012	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 013	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 014	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 015	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 016	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2
L 019	0035986		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
L 028	0078600		NOT ASSIGNED		
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 003	0082319		TRANSSTR MFE-121 MOSFET DUAL GATE	MOS	MFE 121
Q 004	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 022	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 025	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 034	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV5021
R 049	0089054		RESISTOR 180 OHM 1/4W 5% CARBON FILM		
T 001	0129603		TRANSFORMER TRIFILAR Q-3 CORE		
T 002	0123462		TRANSFORMER SPLITTER 1T,2T		
T 003	0123038		TRANSFORMER BALANCED MIXER		
T 004	0123038		TRANSFORMER BALANCED MIXER		
U 001	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A
U 002	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 003	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS P - W
231084

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
003	0125764		SHIELD PHASE LOCK		
004	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173
005	0036261		ASSY PHASE LOCK LO HI BAND AUTO-INSERT		
011	0073318		WIRE 22 BUS	BM	8021
C 001	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 004	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 005	0082586		CAPACITR 15 PF 500V CER DISC P3K 20%	ER	831-000-P3K0-150M
C 008	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 009	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 011	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-409C
C 012	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 013	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 015	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 017	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 019	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 020	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 021	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 022	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 023	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-209C
C 024	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 025	0073490		CAPACITR 5 PF 500V SILVER MICA +-.5PF	CD	CD15CD050D03
C 027	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 028	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 029	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 030	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 031	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 033	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 034	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 035	0035760		CAPACITR 4.0 PF 500V CER DISC COH +-.25P	ER	831-COH0-409C
C 036	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 037	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 038	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 039	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 040	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 041	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 042	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 043	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 044	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 045	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 046	0081746		CAPACITR 1.0 PF 500V CER DISC COK +-.25P	ER	831-COK0-109C
C 047	0081125		CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT	ER	530-000
C 048	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 049	0070470		CAPACITR 10 PF 500V SILVER MICA 5%	CD	CD15CD100J03
C 050	0070541		CAPACITR 500 PF 1KV CER DISC Z5F 10%	CRL	DD 501
C 051	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 052	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 053	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 054	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS P - W - continued
231084

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 055	0070549		CAPACITR .0015 MF 1KV CER Z5U GMV	CRL	DD152G
C 056	0035641		CAPACITR 2-9 PF MIN PC MT	AE	MT10KA/29
C 057	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 058	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 059	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 060	0077390		CAPACITR 27 PF 500V SILVER MICA 5%	CD	CD6ED270J03
C 061	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 062	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 063	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 064	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 065	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 066	0070522		CAPACITR 150 PF 500V SILVER MICA 5%	CD	CD15FD151J03
C 067	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 068	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 069	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 070	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 071	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 072	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 073	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 074	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 075	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 076	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 077	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 078	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 079	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 080	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 081	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR002	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR003	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
CR004	0082311		DIODE MV3102 VARACTOR SIL RIBBON LEADS	MOS	MV3102
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 003	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
L 002	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 003	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 004	0035981		INDUCTOR .085 UH 50 MHZ J-CORE 2.5T BRN	CCT	PER CONT. DWG.
L 005	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 006	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 007	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 008	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 009	0079170		INDUCTOR .05 UH SUBMIN UNSHLD MOLDED 10%	DP	IR-2
L 010	0082356		INDUCTOR 1.5T #22 START MP4 10-32X3/8 J	XZ	BY DESCRIPTION
L 011	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 012	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 013	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 014	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 015	0035988		INDUCTOR 1.13 UH 7-9MHZ J-CORE 17.5T GRY	CCT	PER CONT. DWG.
L 016	0079169		INDUCTOR 1.0 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
PHASE LOCK LOCAL OSCILLATOR
COMMON PARTS - CHANNELS P - W - continued
231084

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 019	0035086		INDUCTOR .437 UH 25 MHZ J-CORE 8.5T BLUE	CCT	PER CONT. DWG.
Q 001	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 003	0082319		TRANSSTR MFE-121 MOSFET DUAL GATE	MOS	MFE 121
Q 004	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 005	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 006	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 007	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 008	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 009	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 003	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 022	0089098		RESISTOR 12K OHM 1/4W 5% CARBON FILM		
R 025	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 034	0078722		POT 5K OHM 1/2W CER 3/8 DIA VERT ADJ	AB	SV5021
R 049	0089054		RESISTOR 180 OHM 1/4W 5% CARBON FILM		
T 001	0129603		TRANSFORMER TRIFILAR Q-3 CORE		
T 002	0123462		TRANSFORMER SPLITTER 1T,2T		
T 003	0123038		TRANSFORMER BALANCED MIXER		
T 004	0123038		TRANSFORMER BALANCED MIXER		
U 001	0078715		IC AMPL CASCODE RF/DC DIFF IN 8L-TO5	RCA	CA3028A
U 002	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 003	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P

Note

The following components change according to channel: C6, C7, C10, C14, C16, C18, C26, C32, CR1, L1, L5, L6, L10, and Y1. Refer to the chart on the schematic diagram, figure 8-50, for the values of the components unique to channels P - W.

PARTS LIST
HYPERBAND PL OUTPUT CONVERTER LOCAL OSCILLATOR MODULE ASSEMBLY, CHANNEL AA
233640

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0231963		SCHEMATIC HYPERBAND PHASE LOCK LO		
	0231967		TEST PROCEDURE PL OUTPUT CONV LO AA-RR		
001	0233820		ASSY PWB PL OUTPUT CONV LO CHNL AA-FF		
002	0232199		MODULE HSG-HYPERBAND PL OUTPUT CONV LO		
003	0230751		FRONT PANEL PL OUTPUT CONV LO CHNL AA		
004	0036250		COVER MODULE		
005	0071322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500		MODULE HANDLE PLASTIC "T"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
008	0073268		WASHER NO. 6 LOCK, SPLIT, CAD PLT STL	XZ	ANSI B18.21.1
009	0072321		SCREW 4-40 X 3/8 F HD,82 DEG,SST	XZ	PER MS51959-15
010	0071495		NUT 4-40 UNC-2B,SM PATT 3/16 HEX,SST	XZ	BY DESCRIPTION
011	0073265		WASHER NO. 4 LOCK, EXT TOOTH, CAD PL STL	XZ	ANSI B18.21.1
012	0233822FG		VCO PLO HYPERBAND AA-FF		
013	0233446		ENCLOSURE VCO-HYPERB PL OUTPUT CONV LO		
014	0233447		COVER VCO-HYPERBAND PL OUTPUT CONV LO		
015	0072319		SCREW 4-40 X 5/16 PAN HD,SST	XZ	PER MS51957-14
016	0076216		TAPE SPRING 3/16 THK X 1 WIDTH	RH	76150
J 001	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 002	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 003	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
U 012	0083236		IC VLTG RGLTR POS 15V 0.5A TYP T0220	MOS	MC7815CT
U 013	0083235		IC VLTG RGLTR POS 5V 0.5A TYP T0220	MOS	MC7805CT

Note

The parts lists for module assemblies 233641 - 233657 (channels BB-RR) are almost identical to the above parts list; therefore, they will not be printed in this manual.

PARTS LIST
HYPERBAND PL OUTPUT CONVERTER LOCAL OSCILLATOR PWB ASSEMBLY
233820

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0233820WPC		WIRE PREP		
001	0231961		PWB HYPERBAND PHASE LOCK LO		
002	0233449		PARTITION SHIELD HYPERBAND P/L OUTPUT		
003	0230892		WIRE 22 GA WHITE BUNCH TINNED		
004	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
005	0081976		SHIELD CAN BRASS .19 DIA HOLE CAD PLATED	STX	307A-40 & DESCRIPTION
C 001	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 002	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 003	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 004	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 005	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 006	0078600		NOT ASSIGNED		
C 007	0078600		NOT ASSIGNED		
C 008	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 009	0081923		CAPACITR 6.0 PF 500V CER DISC COH +-.25P	TPT	831-C0H0-609C
C 010	0088117		CAPACITR 27 PF 1KV CER DISC S2L 10%	CRL	DD270
C 011	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 012	0075199		CAPACITR 82 PF 500V SILVER MICA 5%	CD	CD15ED820J03
C 013	0035761		CAPACITR 5.0 PF 500V CER DISC COH +-.25P	TPT	831-C0H0-509C
C 014	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 015	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 016	0084215		CAPACITR .0022 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-222K
C 017	0084215		CAPACITR .0022 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-222K
C 018	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 019	0170791		CAPACITR .33 MF 100V POLYESTER 5%	PSY	160/.33/J/100/F
C 020	0170791		CAPACITR .33 MF 100V POLYESTER 5%	PSY	160/.33/J/100/F
C 021	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 022	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 023	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 024	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 025	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 026	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 027	0081995		CAPACITR .001 MF 100V CER MONO X7R 10%	ER	8121-100-X7R-102K
C 028	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 029	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	TPT	831-C0J0-309C
C 030	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 031	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 032	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	TPT	831-C0J0-309C
C 033	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 034	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 035	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 036	0079171		CAPACITR 9-35 PF MIN CER DISC PC MT	ER	538-011 D 9-35
C 037	0074492		CAPACITR 15 PF 500V SILVER MICA 5%	CD	CD15CD150J03
C 038	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 039	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 040	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 041	0077512		CAPACITR 24 PF 500V SILVER MICA 5%	CD	CD15ED240J03
C 042	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 043	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z
C 044	0080139		CAPACITR .1 MF 50V CER MONO -20%+80%	ER	8131-050-651-104Z

PARTS LIST
HYPERBAND PL OUTPUT CONVERTER LOCAL OSCILLATOR PWB ASSEMBLY - continued
233820

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 045	0076977		CAPACITR .001 500V FDTHRU SLDR IN		
C 046	0076977		CAPACITR .001 500V FDTHRU SLDR IN		
C 047	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 048	0081210		CAPACITR .01 MF 50V CER MONO X7R 10%	ER	8121-050-X7R-103K
C 049	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
CR001	0085003		DIODE MV209 VARACTOR SIL RADIAL LEADS	MOS	MV209
CR002	0085003		DIODE MV209 VARACTOR SIL RADIAL LEADS	MOS	MV209
CR004	0071142		DIODE 1N4154 SIL 25V 150MA	SY	1N4154
CR006	0078696		DIODE 1N746A SI ZEN 3.3V 5% .4W	TI	1N746A
J 004	0087229		CONN HEADER SGL ROW STRAIGHT 2-PIN PC	AMP	87220-2
J 006	0087229		CONN HEADER SGL ROW STRAIGHT 2-PIN PC	AMP	87220-2
L 001	0081096		INDUCTOR 11-17.5 UH	CDB	434-7X
L 002	0077954		INDUCTOR .47 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0233445		FILTER OUTPUT-HYPERB P/L OUTPUT CONV LO		
L 004	0233445		FILTER OUTPUT-HYPERB P/L OUTPUT CONV LO		
L 005	0145355		INDUCTOR 15.5T #24 6-32X3/8 INCH CARB J	CCT	PER CONT. DWG.
L 006	0145355		INDUCTOR 15.5T #24 6-32X3/8 INCH CARB J	CCT	PER CONT. DWG.
L 007	0082596		INDUCTOR 18 UH SUBMIN UNSHLD 10%	DP	IR-2
P 002	0086884		JUMPER FEMALE .10 INCH CENTERS	BGE	65474-004
Q 001	0077412		TRANSSTR 2N4416 FET N-CHNL JUNC	UC	2N4416
Q 002	0077147		TRANSSTR 2N3947 NPN SIL	MOS	2N3947
Q 003	0084917		TRANSSTR U311 FET N-CHNL JUNC	INL	U311
R 001	0089079		RESISTOR 2.0K OHM 1/4W 5% CARBON FILM		
R 003	0089010		RESISTOR 4.7 OHM 1/4W 5% NICKEL FILM		
R 004	0170686		JUMPER INSULATED BODY .205 IN. LONG T&R	TEV	WL 40
R 005	0078600		NOT ASSIGNED		
R 006	0078600		NOT ASSIGNED		
R 007	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 008	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 009	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 010	0084524		RESISTOR 1.0 MEG 1/4W 5% COMP	AB	RCR07G105JS
R 011	0089064		RESISTOR 470 OHM 1/4W 5% CARBON FILM		
R 012	0089134		RESISTOR 390K OHM 1/4W 5% CARBON FILM		
R 013	0089136		RESISTOR 470K OHM 1/4W 5% CARBON FILM		
R 014	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 015	0089120		RESISTOR 100K OHM 1/4W 5% CARBON FILM		
R 016	0089102		RESISTOR 18K OHM 1/4W 5% CARBON FILM		
R 017	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 018	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 019	0089026		RESISTOR 12 OHM 1/4W 5% CARBON FILM		
R 020	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 021	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		

PARTS LIST
HYPERBAND PL OUTPUT CONVERTER LOCAL OSCILLATOR PWB ASSEMBLY - continued
233820

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 022	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 023	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 024	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 025	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 026	0089084		RESISTOR 3.3K OHM 1/4W 5% CARBON FILM		
R 027	0089070		RESISTOR 820 OHM 1/4W 5% CARBON FILM		
R 028	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 029	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 030	0089034		RESISTOR 27 OHM 1/4W 5% CARBON FILM		
R 031	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 032	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 033	0089060		RESISTOR 330 OHM 1/4W 5% CARBON FILM		
R 034	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 035	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 036	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 037	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 038	0082649		POT 10K OHM 1/2W CER .30 DIA VERT ADJ 4T	BLI	3339P-1-103
R 039	0089096		RESISTOR 10K OHM 1/4W 5% CARBON FILM		
R 040	0089104		RESISTOR 22K OHM 1/4W 5% CARBON FILM		
R 041	0074700		RESISTOR 820 OHM 1/4W 5% COMP	AB	RCR07G821JS
R 042	0074700		RESISTOR 820 OHM 1/4W 5% COMP	AB	RCR07G821JS
S 001	0083296		SWITCH SPST 8 POS PC MT DIP	AMP	435166-5
S 002	0085014		SWITCH SPST 4 SECTIONS DIP PC MT	AMP	1-435668-4
T 001	0233448		TRANSFORMER RUTHROFF 4:1 WIDEBAND		
U 001	0083011		IC CMOS FLIP-FLOP TYPE-D DUAL	MOS	MC14013BCL
U 002	0083021		IC CMOS COUNTER 12-BIT BINARY	MOS	MC14040BCL
U 003	0086636		IC PHASE/FREQ DET TTL FOR PLL 16L-DIP	MOS	MC4044L
U 004	0081726		IC OP AMP 8L-TO5 75C COMP WIDEBAND	HRS	HA2-911-5
U 005	0170291		IC ECL PRESCALER DIVIDE BY-4 1-GHZ	PSS	SP8610BDG
U 006	0084914		IC ECL DIVIDER 200 MHZ DIVIDE BY 10/11	PSS	SP8690B
U 007	0084960		IC TTL COUNTER BIN 35-MHZ	TI	SM74LS161AN
U 008	0084960		IC TTL COUNTER BIN 35-MHZ	TI	SM74LS161AN
U 009	0084960		IC TTL COUNTER BIN 35-MHZ	TI	SM74LS161AN
U 010	0084279		IC TTL GATE NAND 2-IN QUAD	TI	SN74LS00N
U 011	0085114		RESISTOR NETWORK 13 3.3K OHM 2% 14 DIP	BLI	4114R-002-332
U 015	0170775		MIXER DOUBLE BALANCED 1-500 MHZ SELECTED	MCT	SBL-1H
U 016	0082318		IC AMPL RF-IF/VIDEO 8L-DIP	MOS	MC1350P
U 017	0082317		IC AMPL/DETECTOR VIDEO 8L-DIP	MOS	MC1330P
U 018	0084890		IC OP AMP 8L-DIP 70C COMP 741C	MOS	MC1741CP1
W 006	0230892		WIRE 22 GA WHITE BUNCH TINNED		
W 007	0230892		WIRE 22 GA WHITE BUNCH TINNED		
Y 001	0082932		CRYSTAL 6.00 MHZ .001% PARALLEL RES	SEN	HC-18/U HOLDER

PARTS LIST
HYPERBAND PHASE LOCK LOCAL OSCILLATOR VCO
PWB ASSEMBLY, CHANNELS AA - FF
233822

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0233822WPC		WIRE PREP		
001	0231964		PWB VCO-HYPERBAND PL OUTPUT CONV LO		
002	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
004	0085287		STANDOFF 4-40 TD 3/16 MT SWAGE CD P BRSS		
005	0082909		TERMINAL PRESS MT DISCONNECT .058 PIN		
AT001	0035880		ATTNUATR 15 DB FIXED T-PAD TO-5 CASE	NAM	KM1
C 001	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0073486		CAPACITR 1 PF 500V CER TUBULAR	A	CC20CK010C
C 004	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 005	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-209C
C 006	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 007	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 008	0081924		CAPACITR 7.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-709C
C 009	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 010	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 011	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 013	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 014	0078600		NOT ASSIGNED		
C 015	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 016	0170789		CAPACITR .027 MF 400V POLYESTER 5%	PSY	160/.027/J/400/C
C 017	0170790		CAPACITR .068 MF 250V POLYESTER 5%	PSY	160/.068/J/250/C
C 018	0078600		NOT ASSIGNED		
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0084760		DIODE MV3140 VARACTOR SIL RIBBON LEADS		
CR002	0074186		DIODE IN935A TC REF 9.0V .01% .5W	MOS	IN935A
L 001	0233825		ASSY-INDUCTOR VCO-LOW		
L 002	0078842		INDUCTOR 12 MH MIN SHLD ENCAP 10%	NYT	WEE-12000
L 003	0078841		INDUCTOR 4.7 MH MIN SHLD ENCAP 10%	NYT	WEE-4700
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0084095		TRANSSTR BFR 91 NPN SIL RF	AE	BFR 91
R 001	0089092		RESISTOR 6.8K OHM 1/4W 5% CARBON FILM		
R 002	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 003	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 004	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 005	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 006	0089072		RESISTOR 1.0K OHM 1/4W 5% CARBON FILM		
R 007	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 008	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 009	0089052		RESISTOR 150 OHM 1/4W 5% CARBON FILM		
R 010	0089055		RESISTOR 200 OHM 1/4W 5% CARBON FILM		
R 011	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
T 001	0233448		TRANSFORMER RUTHROFF 4:1 WIDEBAND		
XAT01	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
HYPERBAND PHASE LOCK LOCAL OSCILLATOR VCO
PWB ASSEMBLY, CHANNELS GG - LL
233823

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0233822A1P		AUTO INSERTION VCO HYPERBAND		
	0233822WPC		WIRE PREP		
002	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
004	0085287		STANDOFF 4-40 ID 3/16 HT SWAGE CO P BRSS		
005	0082909		TERMINAL PRESS MT DISCONNECT .058 PIN		
AT001	0035880		ATTNUATR 15 DB FIXED T-PAD TO-5 CASE	NAM	KM1
C 001	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0073486		CAPACITR 1 PF 500V CER TUBULAR	A	CC20CK010C
C 004	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 005	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	TPT	831-COKO-209C
C 006	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 007	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 008	0081924		CAPACITR 7.0 PF 500V CER DISC COH +-.25P	TPT	831-COHO-709C
C 009	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 010	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 011	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 013	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 014	0078600		NOT ASSIGNED		
C 015	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362B106K025AS
C 016	0170789		CAPACITR .027 MF 400V POLYESTER 5%	PSY	160/.027/J/400/C
C 017	0170790		CAPACITR .068 MF 250V POLYESTER 5%	PSY	160/.068/J/250/C
C 018	0078600		NOT ASSIGNED		
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0084760		DIODE MV3140 VARACTOR SIL RIBBON LEADS		
L 001	0233826		ASSY-INDUCTION VCO-MID		
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0084095		TRANSSTR BFR 91 NPN SIL RF	AE	BFR 91
T 001	0233448		TRANSFORMER RUTHROFF 4:1 WIDEBAND		
XAT01	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
HYPERBAND AND EXTENDED HYPERBAND PHASE LOCK LOCAL OSCILLATOR VCO PWB ASSEMBLY, CHANNELS MM - WW
233824

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0233R22AIP		AUTO INSERTION VCO HYPERBAND		
	0233R22WPC		WIRE PREP		
002	0086759		SPACER LEAD, GLASS BEAD GREEN	WCO	2120L GREEN
004	0085287		STANDOFF 4-40 ID 3/16 HT SWAGE CD P BRSS		
005	0082909		TERMINAL PRESS MT DISCONNECT .058 PIN		
AT001	0035880		ATTNUATR 15 DB FIXED T-PAD TO-5 CASE	NAM	KM1
C 001	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362R106K025AS
C 002	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
C 003	0073486		CAPACITR 1 PF 500V CER TUBULAR	A	CC20CK010C
C 004	0083007		CAPACITR 1.3-5.4 PF AIR PC MT	J	187-0103-005
C 005	0081748		CAPACITR 2.0 PF 500V CER DISC COK +-.25P	TPT	831-COK0-209C
C 006	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 007	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 008	0081924		CAPACITR 7.0 PF 500V CER DISC COH +-.25P	TPT	831-COH0-709C
C 009	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362R106K025AS
C 010	0083258		CAPACITOR CHIP .1 MF 50V	KEM	C1813C104M5XAH
C 011	0082952		CAPACITR 220 PF 1KV CER DISC Z5F 10%	CRL	DD-221
C 013	0035656		CAPACITR 100 MF 20V SOLID TANT POL 10%	KEM	T362D107K020AS
C 014	0078600		NOT ASSIGNED		
C 015	0035654		CAPACITR 10 MF 25V SOLID TANT POL 10%	KEM	T362R106K025AS
C 016	0170789		CAPACITR .027 MF 400V POLYESTER 5%	PSY	160/.027/J/400/C
C 017	0170790		CAPACITR .068 MF 250V POLYESTER 5%	PSY	160/.068/J/250/C
C 018	0078600		NOT ASSIGNED		
C 019	0070549		CAPACITR .0015 MF 1KV CER DISC Z5U GMV	CRL	DD152G
CR001	0084760		DIODE MV3140 VARACTOR SIL RIBBON LEADS		
L 001	0233827		ASSY-INDUCTOR, VCO-HIGH		
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0084095		TRANSSTR BFR 91 NPN SIL RF	AE	BFR 91
T 001	0233448		TRANSFORMER RUTHROFF 4:1 WIDEBAND		
XAT01	0081666		SOCKET TO-5 CASE 3-PIN	RBN	SD5173

PARTS LIST
SPECTRUM INVERTER MODULE ASSEMBLY
230250

REF DESIG	PART NO.	FN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230253		SPECTRUM INVERTER SCHEM DIAG		
001	0230252		ASSY SPECTRUM INVERTER PC BOARD		
002	0116547		MODULE CASTING		
003	0230256		FRONT PANEL SPECTRUM INVERTER		
004	0036250		COVER MODULE		
005	0077322		SCREW 4-40 X 1/4 PAN HD,TAPTITE,CAD PLT	CS	BY DESCRIPTION
006	0231500		MODULE HANDLE PLASTIC "T"		AS PER S/A DWGC231500
007	0072380		SCREW 6-32 X 3/4 SOC CAP SST	XZ	PER MS16995-20
008	0073268		WASHER NO. 6 LOCK, SPLIT, CAD PLT STL	XZ	ANSI B18.21.1
J 001	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121
J 011	0082351		CONN COAX F FEM TO PUSH ON FEM CHSS MT	GIL	GF-1121

PARTS LIST
SPECTRUM INVERTER PWB ASSEMBLY
230252

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
	0230252AIP		ASSY SPECTRUM INVERTER AUTO INSERTION		
	0230252WPC		ASSY SPECTRUM INVERTER WIRE LIST		
001	0230251		SPECTRUM INVERTER PC BD		
002	0123468		SHIELD CAN SMALL	JLO	PER SA DWG 123468
C 001	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 002	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 003	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 004	0082011		CAPACITR 6.2 PF 100V CER DISC COH +-.25P	ER	835-024-COHO-629C
C 005	0082007		CAPACITR 4.3 PF 100V CER DISC COH +-.25P	ER	835-024-COHO-439C
C 006	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 007	0070508		CAPACITR 62 PF 500V SILVER MICA 5%	CD	CD15ED620J03
C 008	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 009	0035762		CAPACITR 8.0 PF 500V CER DISC COH +-.25P	ER	831-COHO-809C
C 010	0073495		CAPACITR 39 PF 500V SILVER MICA 5%	CD	CD15ED390J03
C 011	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 012	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 013	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 014	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 015	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 016	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 017	0082010		CAPACITR 5.6 PF 100V CER DISC COH +-.25P	ER	835-024-COHO-569C
C 018	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 019	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 020	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 021	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 022	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 023	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 024	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 025	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 026	0082014		CAPACITR 8.2 PF 100V CER DISC COH +-.25P	ER	835-024-COHO-829C
C 027	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 028	0082014		CAPACITR 8.2 PF 100V CER DISC COH +-.25P	ER	835-024-COHO-829C
C 029	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 030	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	ER	831-COJO-309C
C 031	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 032	0070482		CAPACITR 20 PF 1 KV CER DISC S2L 10%	CRL	DD200
C 033	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 034	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 035	0070525		CAPACITR 150 PF 1KV CER DISC S3N 10%	CRL	DD-151
C 036	0082433		CAPACITR 24 PF 100V CER DISC COG 5%	ERT	835-024-COGO-240J
C 037	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 038	0070509		CAPACITR 68 PF 500V SILVER MICA 5%	CD	CD15ED680J03
C 040	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 041	0035759		CAPACITR 3.0 PF 500V CER DISC COJ +-.25P	ER	831-COJO-309C
C 042	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 043	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 044	0035642		CAPACITR 2-18 PF MIN PC MT	AE	HT10KA/218
C 045	0081929		CAPACITR 13 PF 500V CER DISC COG 5%	ER	831-COGO-130J
C 046	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 047	0082433		CAPACITR 24 PF 100V CER DISC COG 5%	ERT	835-024-COGO-240J

PARTS LIST
SPECTRUM INVERTER PWB ASSEMBLY - continued
230252

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
C 048	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 049	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 050	0070474		CAPACITR 10 PF 1 KV CER DISC S2L 10%	CRL	DD-100
C 051	0073495		CAPACITR 39 PF 500V SILVER MICA 5%	CD	CD15ED390J03
C 052	0035641		CAPACITR 2-9 PF MIN PC MT	AE	HT10KA/29
C 053	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 054	0070544		CAPACITR .001 MF 1KV CER DISC Z5F 10%	CRL	DD102
C 055	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
C 056	0081253		CAPACITR 270 PF 1KV CER DISC Z5F 10%	CRL	DD271
C 057	0070509		CAPACITR 68 PF 500V SILVER MICA 5%	CD	CD15ED680J03
C 058	0070496		CAPACITR 43 PF 500V SILVER MICA 5%	CD	CD15ED430J03
CR001	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR002	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR003	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR004	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR005	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR006	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR007	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
CR008	0087317		DIODE 5082-2826 UHF SCHOTTKY BATCH MTCHD	HP	5082-2826
E 001	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
E 002	0081718		CORE BEAD FERRITE 7D .138X.037X.150L GRN	STK	57-1413
J 002	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 003	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 004	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 005	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 006	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 007	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 008	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 009	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
J 010	0081632		SOCKET PIN .040 DIA CLOSED BOTTOM	CTC	450-3704-01-06-00
L 001	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 002	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 003	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 004	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 005	0082456		INDUCTOR 23.5T #22 ST MP1 2 10-32X3/8 J	XZ	BY DESCRIPTION
L 006	0077944		INDUCTOR .27 UH SUBMIN UNSHLD 10%	DP	IR-2
L 007	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 008	0082456		INDUCTOR 23.5T #22 ST MP1 2 10-32X3/8 J	XZ	BY DESCRIPTION
L 009	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 010	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 011	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 012	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 013	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 014	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2

PARTS LIST
SPECTRUM INVERTER PWB ASSEMBLY - continued
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REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
L 015	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 016	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 017	0079168		INDUCTOR .68 UH SUBMIN UNSHLD 10%	DP	IR-2
L 018	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 019	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 020	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 021	0079168		INDUCTOR .68 UH SUBMIN UNSHLD 10%	DP	IR-2
L 022	0079141		INDUCTOR 1.8 UH SUBMIN UNSHLD 10%	DP	IR-2
L 023	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
L 024	0079167		INDUCTOR .33 UH SUBMIN UNSHLD 10%	DP	IR-2
L 025	0079166		INDUCTOR .15 UH SUBMIN UNSHLD 10%	DP	IR-2
L 026	0079330		INDUCTOR .22 UH SUBMIN UNSHLD 10%	DP	IR-2
L 027	0082591		INDUCTOR .39 UH SUBMIN UNSHLD 10%	DP	IR-2
L 028	0082591		INDUCTOR .39 UH SUBMIN UNSHLD 10%	DP	IR-2
L 029	0079165		INDUCTOR .1 UH SUBMIN UNSHLD 10%	DP	IR-2
P 001	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
P 002	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
P 003	0082455		JUMPER MALE INSULATED .20 SPACING	CTC	461-2871-01-00-10
Q 001	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 002	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 003	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 004	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 005	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 006	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
Q 007	0035669		TRANSSTR 2N5179 SIL NPN	MOS	2N5179
R 001	0089048		RESISTOR 100 OHM 1/4W 5% CARBON FILM		
R 002	0089056		RESISTOR 220 OHM 1/4W 5% CARBON FILM		
R 003	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 005	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 006	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 007	0089095		RESISTOR 9.1K OHM 1/4W 5% CARBON FILM		
R 008	0089086		RESISTOR 3.9K OHM 1/4W 5% CARBON FILM		
R 009	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 010	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 011	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 012	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 013	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 014	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 015	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 016	0089062		RESISTOR 390 OHM 1/4W 5% CARBON FILM		
R 017	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 018	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 019	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 020	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 021	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		

PARTS LIST
SPECTRUM INVERTER PWB ASSEMBLY - continued
230252

REF DESIG	PART NO.	EN RV	DESCRIPTION	VENDOR	VENDOR PART NUMBER
R 022	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 023	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		
R 024	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
R 025	0089066		RESISTOR 560 OHM 1/4W 5% CARBON FILM		
R 026	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 027	0089080		RESISTOR 2.2K OHM 1/4W 5% CARBON FILM		
R 028	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 029	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 030	0089074		RESISTOR 1.2K OHM 1/4W 5% CARBON FILM		
R 031	0089076		RESISTOR 1.5K OHM 1/4W 5% CARBON FILM		
R 032	0089040		RESISTOR 47 OHM 1/4W 5% CARBON FILM		
R 033	0089044		RESISTOR 68 OHM 1/4W 5% CARBON FILM		
R 034	0089036		RESISTOR 33 OHM 1/4W 5% CARBON FILM		
R 035	0089024		RESISTOR 10 OHM 1/4W 5% CARBON FILM		
R 037	0089058		RESISTOR 270 OHM 1/4W 5% CARBON FILM		
R 038	0089068		RESISTOR 680 OHM 1/4W 5% CARBON FILM		
R 039	0089100		RESISTOR 15K OHM 1/4W 5% CARBON FILM		
R 040	0089088		RESISTOR 4.7K OHM 1/4W 5% CARBON FILM	ROM	R-25 BY DESCRIPTON
T 001	0123038		TRANSFORMER BALANCED MIXER		
T 002	0123038		TRANSFORMER BALANCED MIXER		
T 003	0123038		TRANSFORMER BALANCED MIXER		
T 004	0123038		TRANSFORMER BALANCED MIXER		
TP001	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
TP002	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
TP003	0233600		CONN COAX F FEM TO PC BRD CHSS OR PC MT		
Y 001	0081572		CRYSTAL 115.00 MHZ .0025% SERIES RES	SEN	SCM-18 HOLDER
Y 002	0082557		CRYSTAL 101.50 MHZ .0025% SERIES RES	ERT	HC-18/U HOLDER

MANUFACTURERS' CODES

Vendor Code	Manufacturer
A	Aerovox Corporation New Bedford, MA
AB	Allen-Bradley Milwaukee, WI
ABE	Amphenol Corporation Broadview, IL
AE	Amperex Electronics Hicksville, L.I., NY
AEP	Alco Electronics Products, Inc. No. Andover, MA
AIS	Airco-Speer Electronic Components San Rafael, CA
AMP	AMP, Inc. Harrisburg, PA
APH	Alpha Industries Havertown, PA
BM	Belden Manufacturing Co. Chicago, IL
CBR	Colber Corporation/Union Carbide Irvington, NJ
CCT	Coilcraft Cary, IL
CD	Cornell-Dubilier So. Plainfield, NJ
CK	C & K Components, Inc. Newton, MA
CKI	CTS Knights, Inc. Sandwich, IL
CLX	Clairex Corporation New York, NY

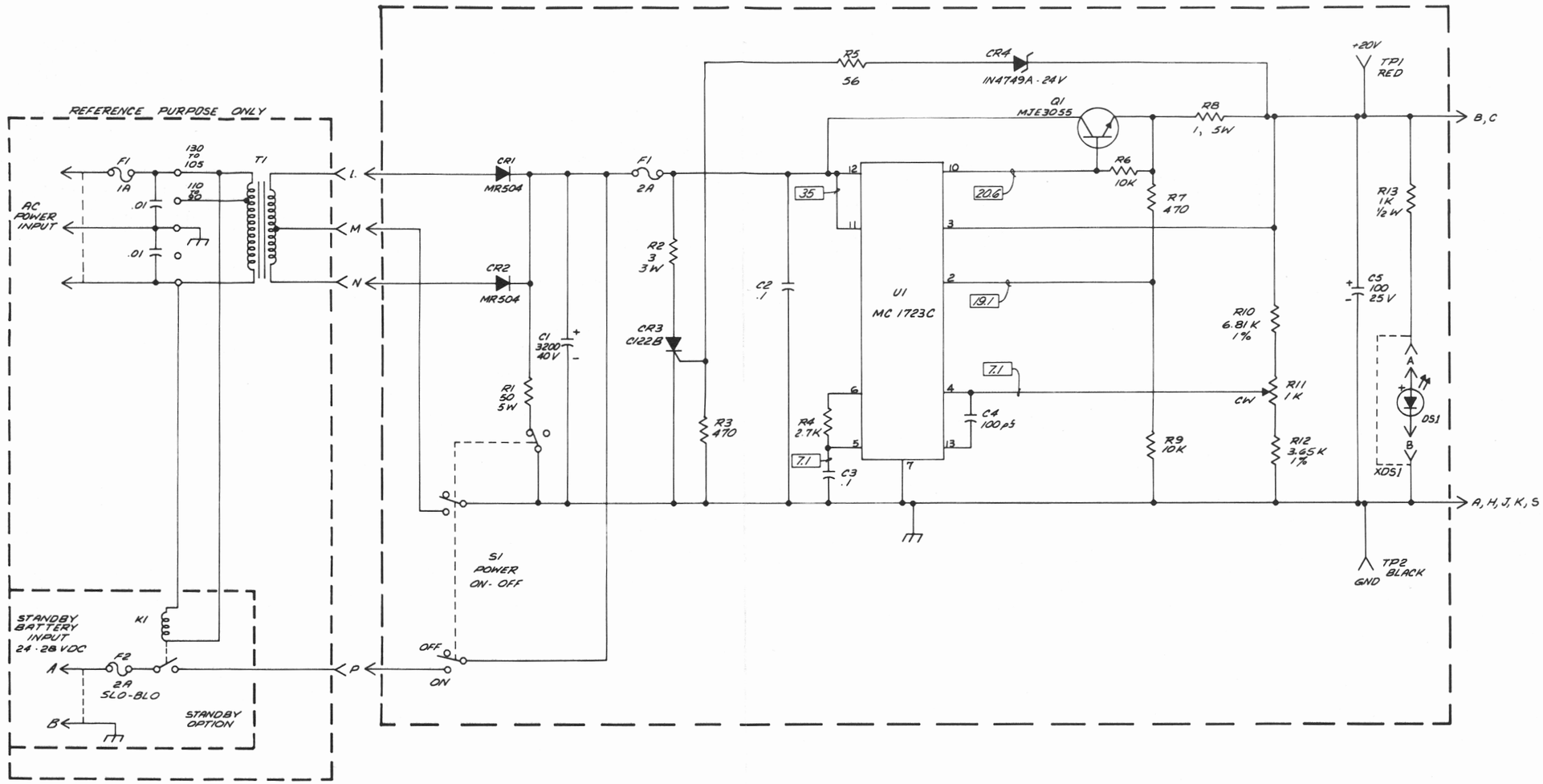
Vendor Code	Manufacturer
CRL	Centralab Milwaukee, WI
CS	Continental Screw Company New Bedford, MA
CTC	Cambridge Thermionic Corporation Cambridge, MA
DI	Dialight Corporation Brooklyn, NY
DP	Dale Products, Inc. Columbus, NE
ER	Erie Resistor Corporation Erie, PA
ERT	Erie Technological Products, Inc. Tech. Materials Division State College, PA
FSC	Fairchild Semiconductor Corp. San Rafael, CA
GE	General Electric Schenectady, NY
GIL	Gilbert Engineering Co. Phoenix, AZ
HP	Hewlett-Packard Palo Alto, CA
ITT	ITT Wire and Cable Atlanta, GA
J	E. F. Johnson Company Waseca, MN
JLO	JLO Metal Products Chicago, IL
KEM	Kemet Division/Union Carbide Greenville, SC

Vendor Code	Manufacturer
L	Littlefuse, Inc. Des Plaines, IL
M	J. W. Miller Company Los Angeles, CA
MOS	Motorola Semiconductor Products Phoenix, AZ
NAM	North American Micro Limited Stoney Creek, Ontario
NSC	National Semiconductor Corp. Danbury, CT
PAN	Panduit Corporation Tinley Park, IL
PIH	Piker International Corp. Des Plaines, IL
RBN	Robinson Nugent New Albany, IN
RCA	Radio Corporation of America Harrison, NJ
SAI	Siemens America, Inc. New York, NY
SEN	Sentry Mfg. Oklahoma City, OK
SGC	Sangamo Electric Co. Springfield, IL
SH	Herman H. Smith Brooklyn, NY
SP	Sprague Products Company Huntsville, AL
SPU	Spectrum Control, Inc. Fairview, PA

Vendor Code	Manufacturer
STK	Stackpole Carbon Company Magnet Division St. Marys, PA
SY	Sylvania Electric Products New York, NY
THC	Thermalloy Company Dallas, TX
THM	Thermetics, Inc. Elm City, NC
TI	Texas Instruments Dallas, TX
TO	Memcor, Inc. Components Div. Tru-Ohm Huntington, IN
UNC	Unitrode Corp. Watertown, MA
VEC	Victory Engineering Corp. Springfield, NJ
WCO	Holiday Industries Bronx, NY
XZ	Any manufacturer that produces this part to appropriate military, Federal, or commercial specifications.
ZIE	Zierick Manufacturing Corp. Mt. Kisco, NY

SECTION 8
DRAWINGS

This section contains schematic diagrams and assembly drawings for the Model 6350 Television Modulators.

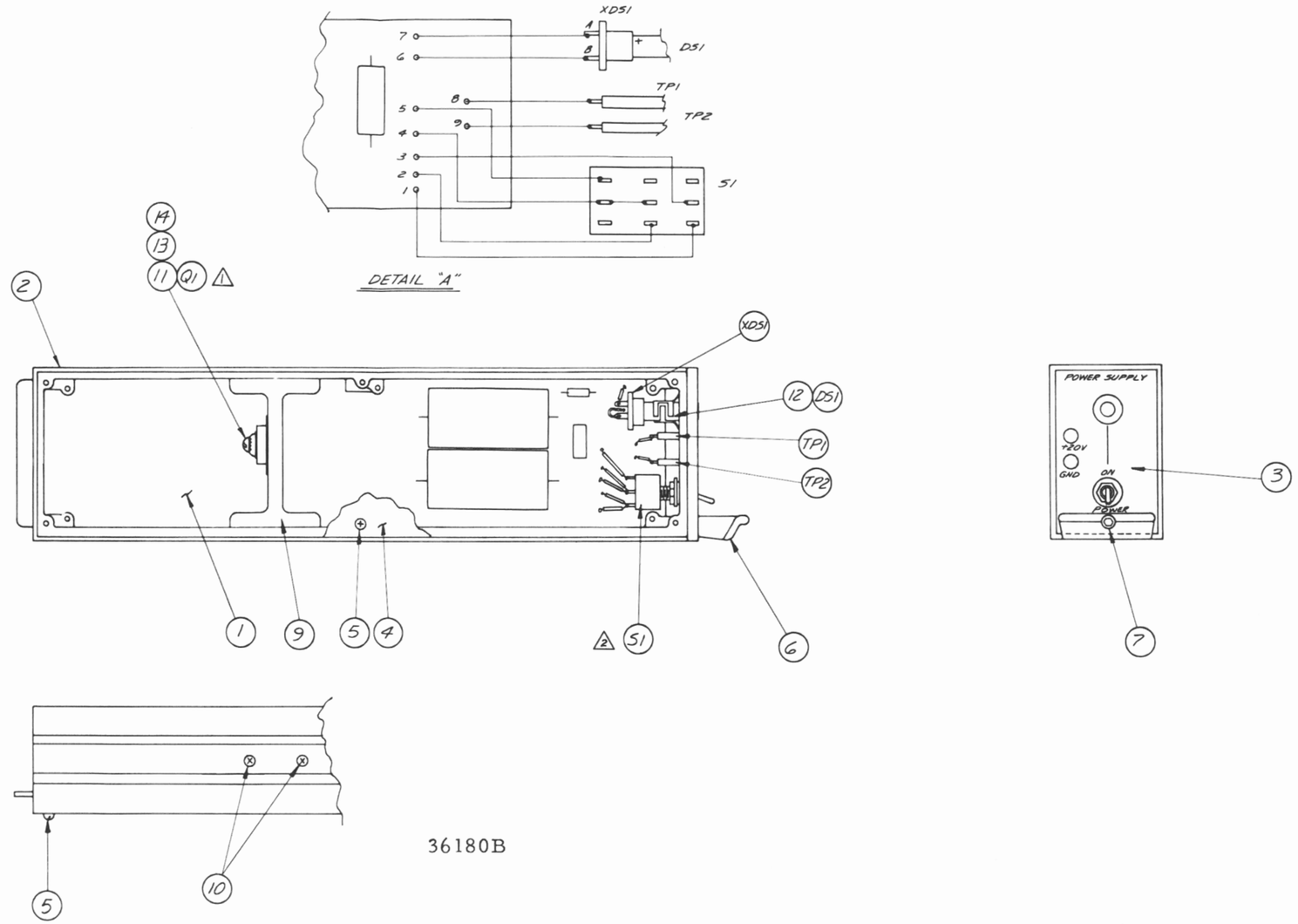


NOTES:

1. VOLTAGE MEASUREMENTS MADE WITH A.C. LINE VOLTAGE OF 115VAC. WITH THE POWER SUPPLY OPERATING UNDER UNDER NO LOAD. VOLTAGE VARIATION OF ±20% IS NORMAL.

36183A

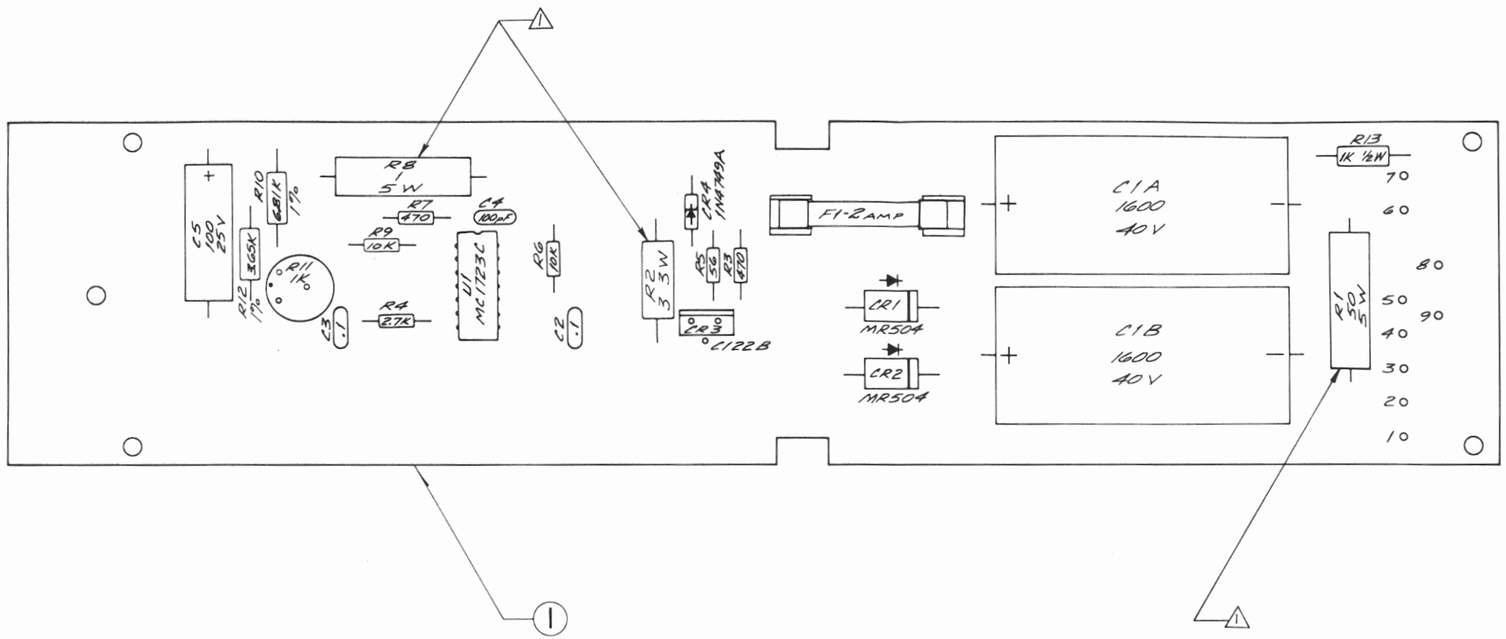
Figure 8-1. Model 6350
Power Supply Schematic Diagram



NOTES:

1. USE DISHED LOCKWASHER AND MICA WASHER ISSUED WITH Q1. USE HEAT SINK COMPOUND SA NO. 82640 (DOW-CORNING 340) ON BOTH SIDES OF MICA WASHER.
2. USE NUTS AND LOCKWASHERS ISSUED WITH PART.

Figure 8-2. Model 6350 Power Supply Assembly



WIRE CHART		
ITEM	COLOR	LENGTH
W1	BROWN	1 3/8
W2	RED	1 ½
W3	ORANGE	1 3/4
W4	YELLOW	2 ½
W5	GREEN	1 ½
W6	WHITE	2 - B
W7	BLACK	2 - A
W8	BLACK	2
W9	BLACK	2

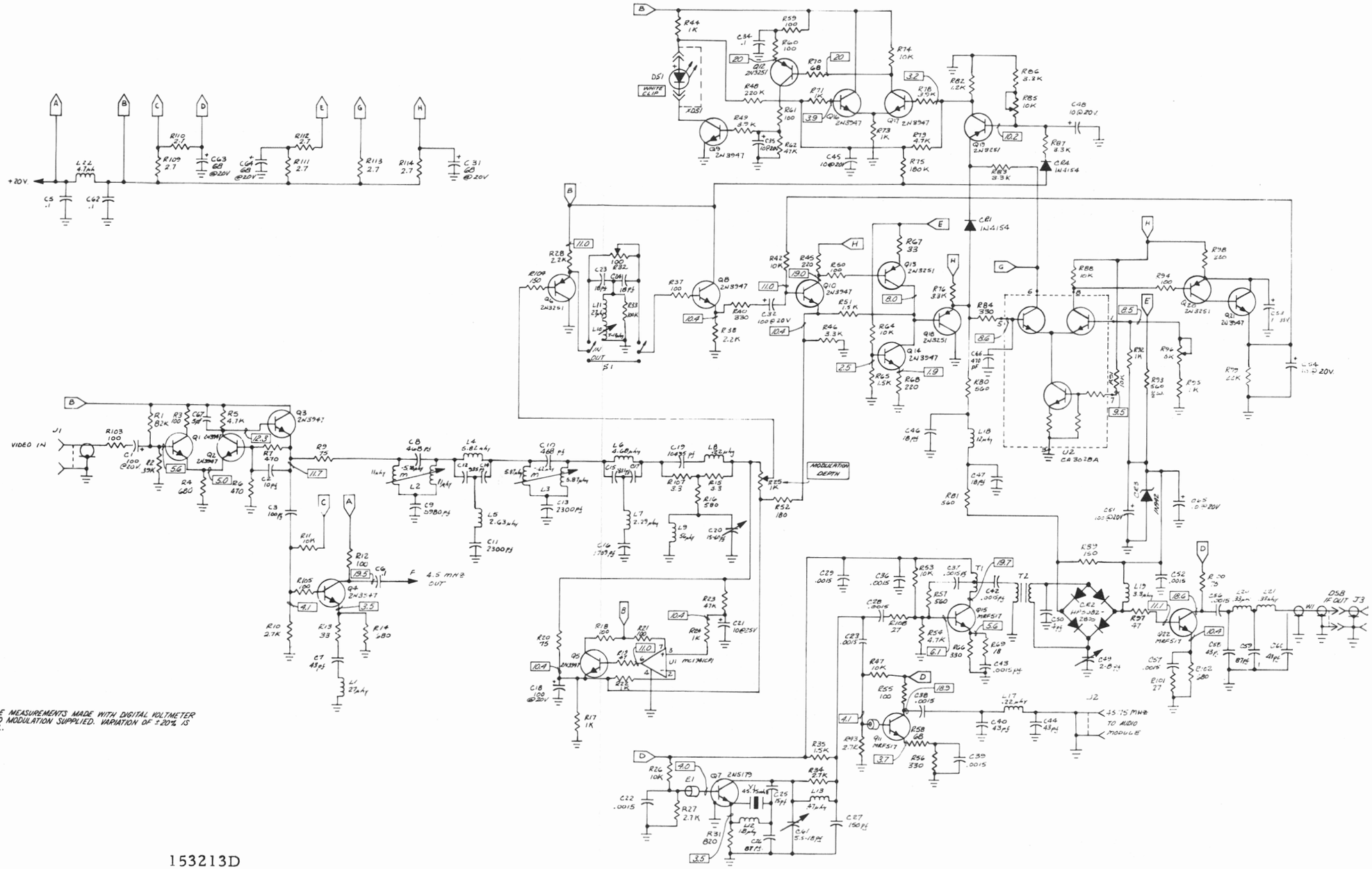
36182B

NOTE: ⚠ MOUNT R1, R2 AND R8 ¼ INCH ABOVE PW BOARD

25R243D

SEE SEPARATE PARTS LIST

Figure 8-3. Model 6350 Power Supply Printed-Wiring Board Assembly



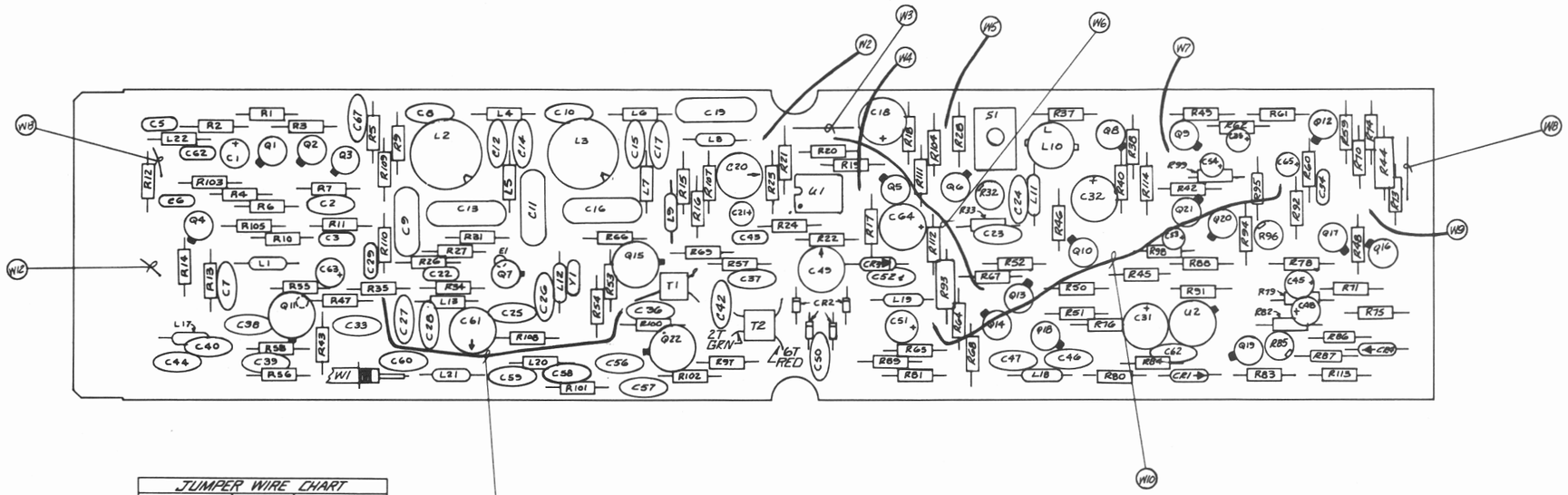
NOTES:

1. VOLTAGE MEASUREMENTS MADE WITH DIGITAL VOLTMETER WITH NO MODULATION SUPPLIED. VARIATION OF ±20% IS NORMAL.

153213D

Figure 8-4. Model 6350
Video Modulator Schematic Diagram

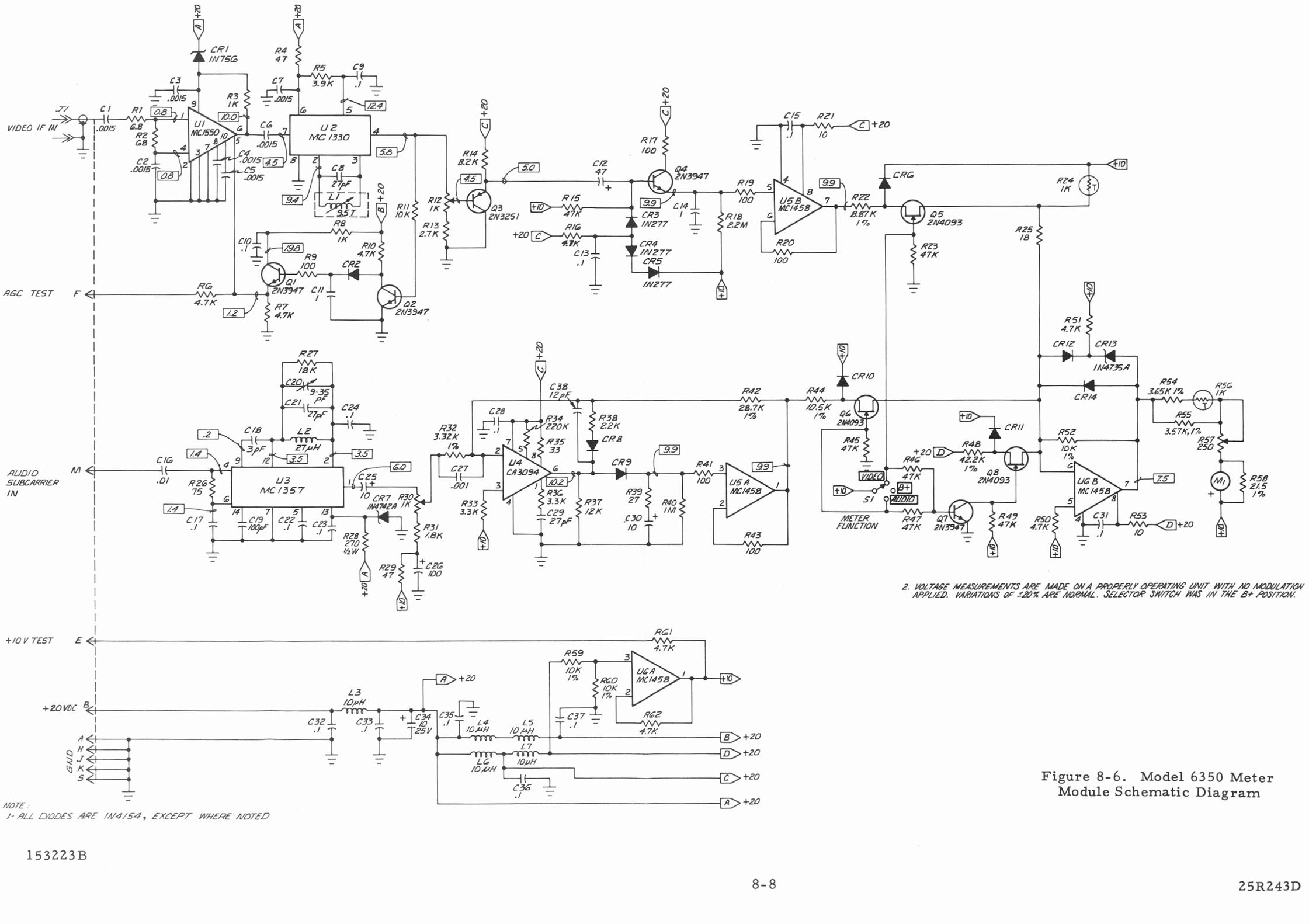
25R243B



JUMPER WIRE CHART		
JUMPER	LENGTH	COLOR
W2	6	BLUE
W3	1	INSUL BUSS
W4	5½	BLACK
W5	5	GREEN
W6	2½	YELLOW
W7	2½	BROWN
W8	1	BUSS
W9	2½	PINK
W10	3¾	WHITE
W11	3½	RED
W12	1	BUSS
W13	1	BUSS
W1	6	RG-179 COAX

153212F

Figure 8-5. Model 6350
Video Modulator
Printed-Wiring Board Assembly

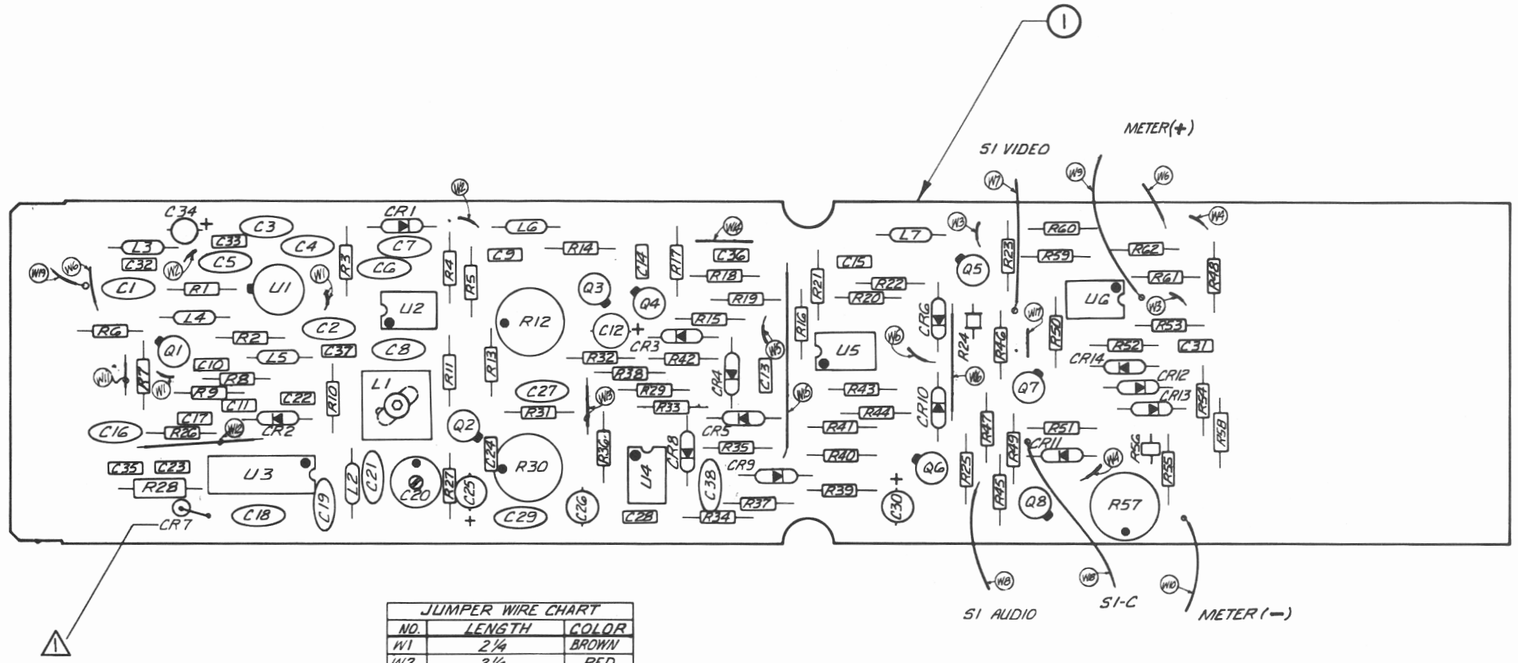


NOTE:
1- ALL DIODES ARE IN4154, EXCEPT WHERE NOTED

2. VOLTAGE MEASUREMENTS ARE MADE ON A PROPERLY OPERATING UNIT WITH NO MODULATION APPLIED. VARIATIONS OF ±20% ARE NORMAL. SELECTOR SWITCH WAS IN THE B+ POSITION.

Figure 8-6. Model 6350 Meter Module Schematic Diagram

153223B



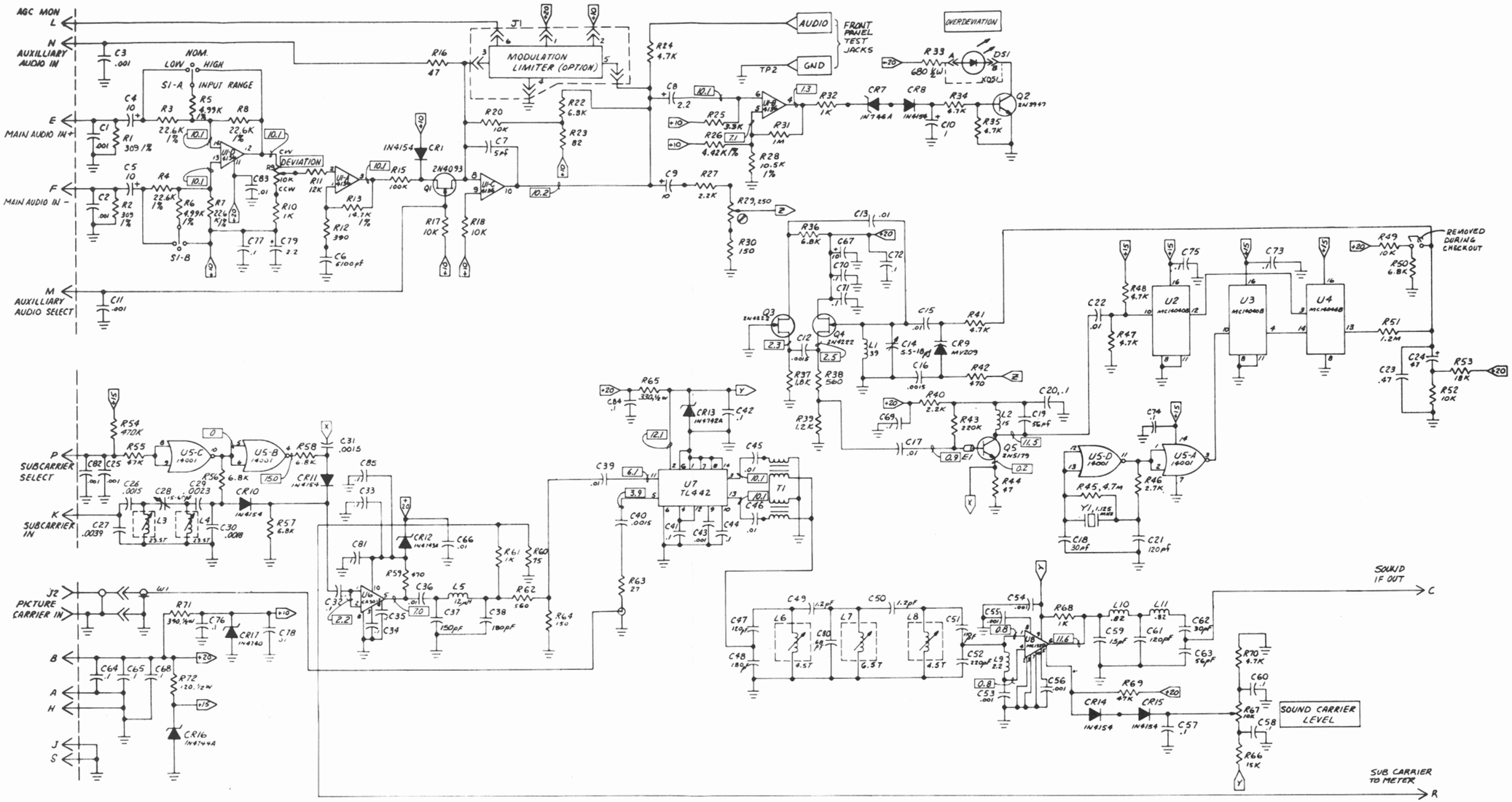
NOTES:

⚠ CR7 CATHODE RING POSITIONED DOWN (CLOSEST TO PW BOARD).

JUMPER WIRE CHART		
NO.	LENGTH	COLOR
W1	2¼	BROWN
W2	3¼	RED
W3	2¾	RED
W4	4	YELLOW
W5	2	WHT
W6	9	GRAY
W7	6	VIOLET
W8	5	BLUE
W9	1	GREEN
W10	1¼	BLACK
W11	¾	INS BLISS
W12	1⅜	↓
W13	⅞	↓
W14	⅞	↓
W15	1⅜	↓
W16	1¼	↓
W17	¾	INS BLISS
W18	5	WHT
W19	1½	BUSS

153222B

Figure 8-7. Model 6350
Meter Module
Printed-Wiring Board Assembly



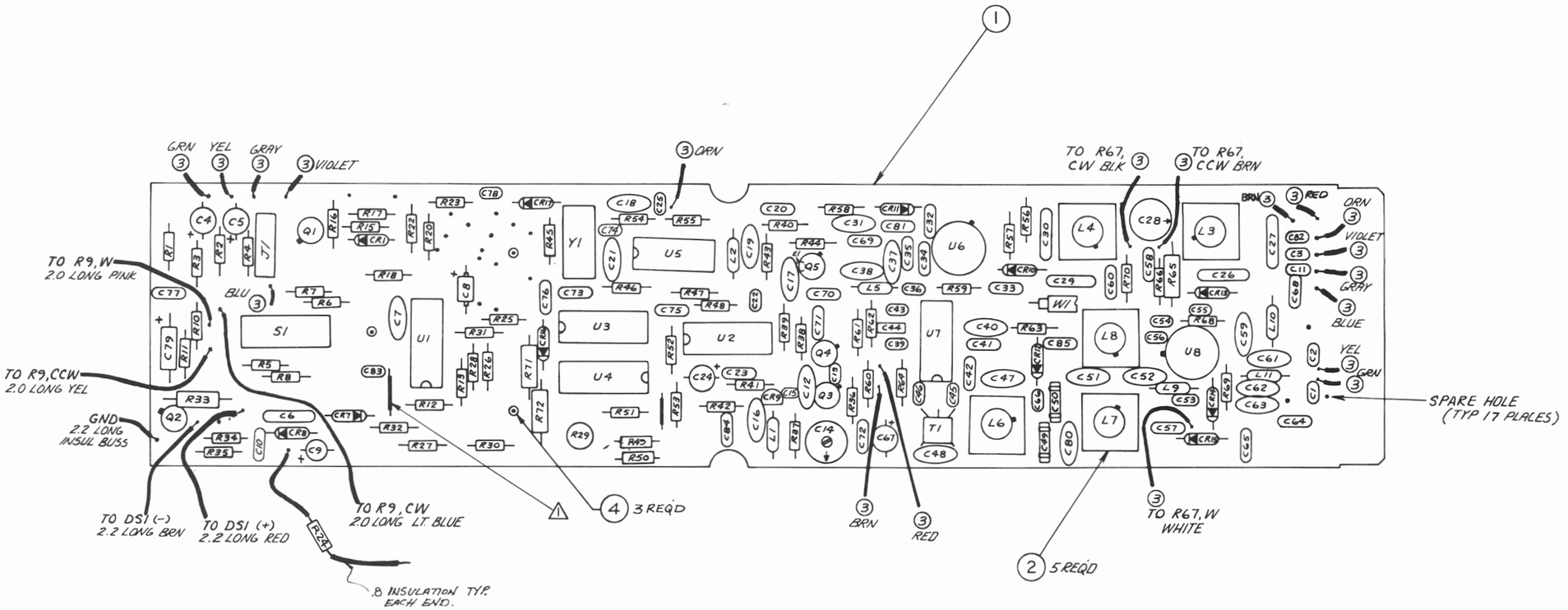
NOTE:

1. ALL INDUCTORS ARE IN MICROHENRIES UNLESS OTHERWISE SPECIFIED
2. VOLTAGE MEASUREMENTS ARE MADE ON PROPERLY OPERATING UNIT WITH NO SIGNAL APPLIED, BASEBAND AUDIO MODE. VARIATION OF ±20% IS NORMAL.

153233E

Figure 8-8. Model 6350
Audio Modulator Schematic Diagram

25R243B



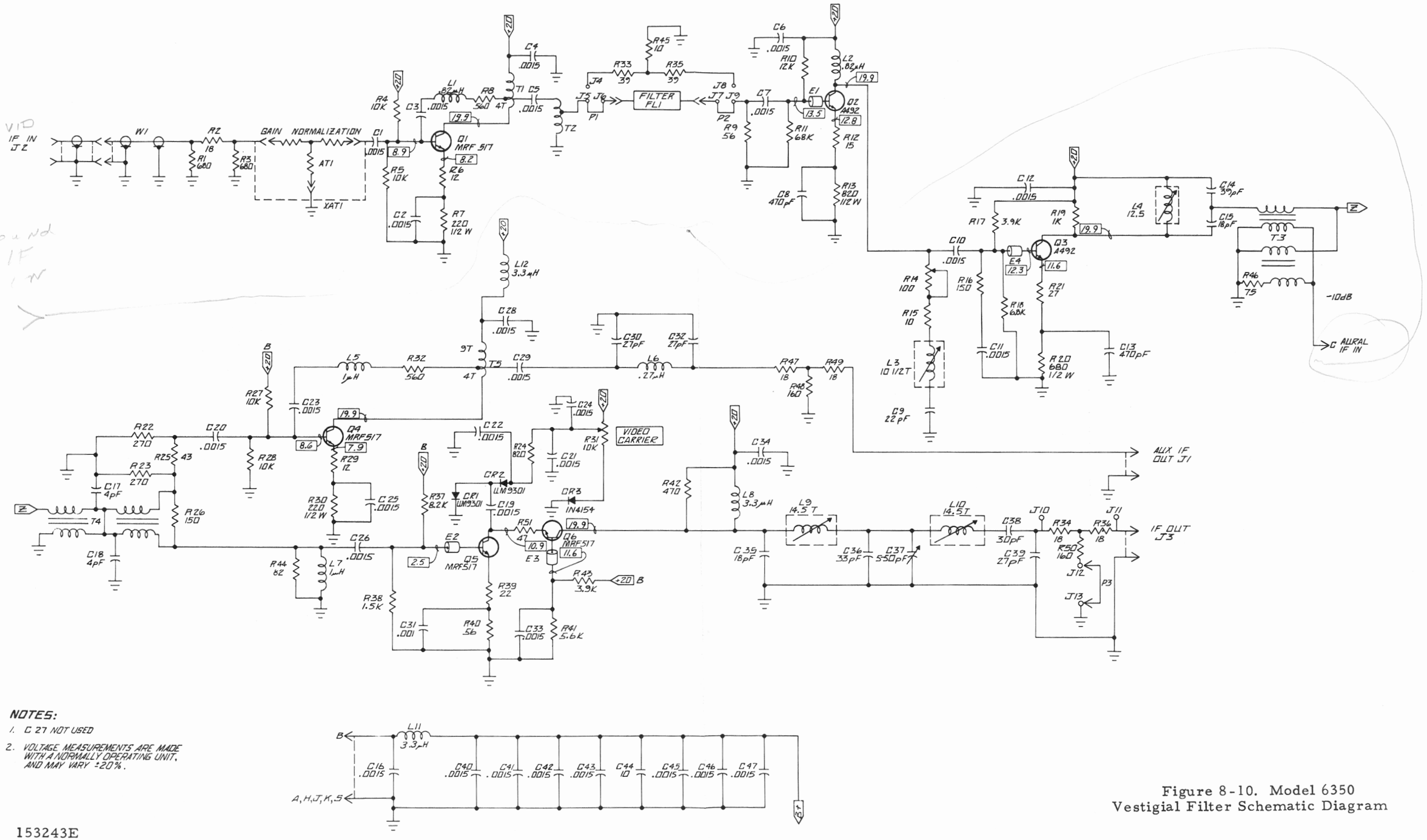
NOTES:

⚠ ALL BUSS WIRE TO BE INSULATED.

2. ALL WIRES WITH SPECIFIED LENGTHS ARE NO. 22 GA.

153232A

Figure 8-9. Model 6350 Audio Modulator Printed-Wiring Board Assembly



Sound IF in

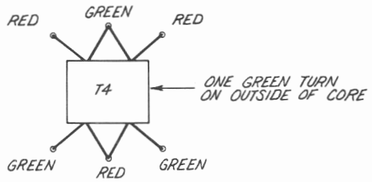
NOTES:

1. C 27 NOT USED
2. VOLTAGE MEASUREMENTS ARE MADE WITH A NORMALLY OPERATING UNIT, AND MAY VARY ±20%.

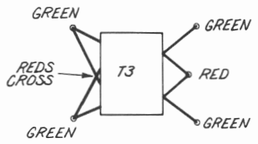
153243E

Figure 8-10. Model 6350
Vestigial Filter Schematic Diagram

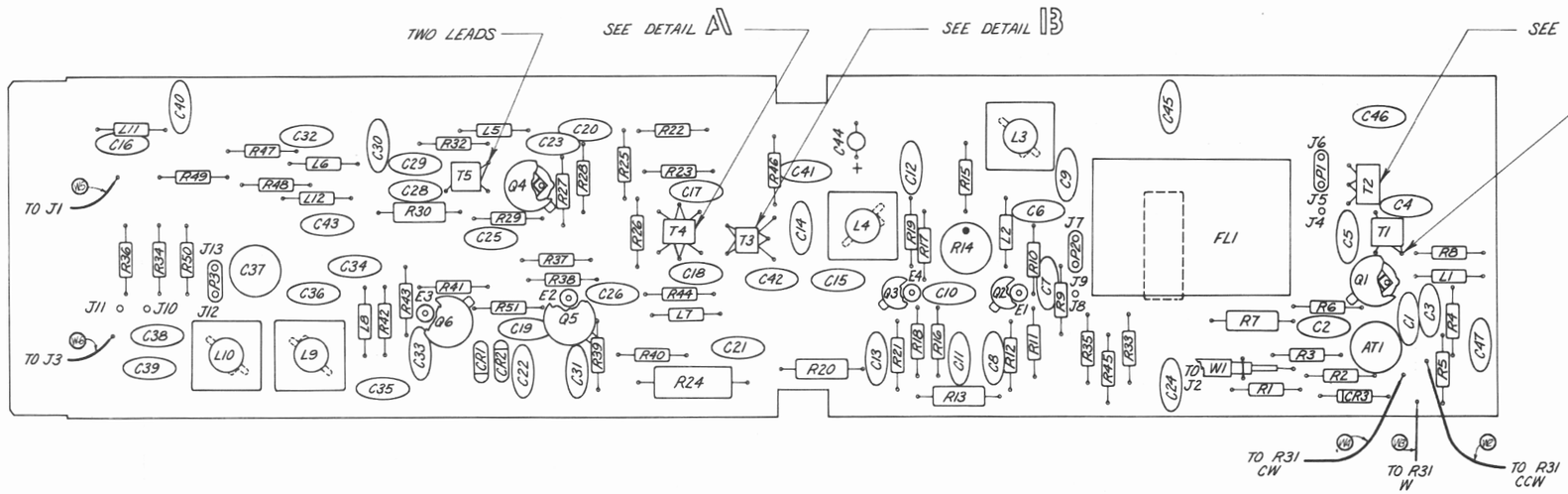
25R243B



DETAIL A



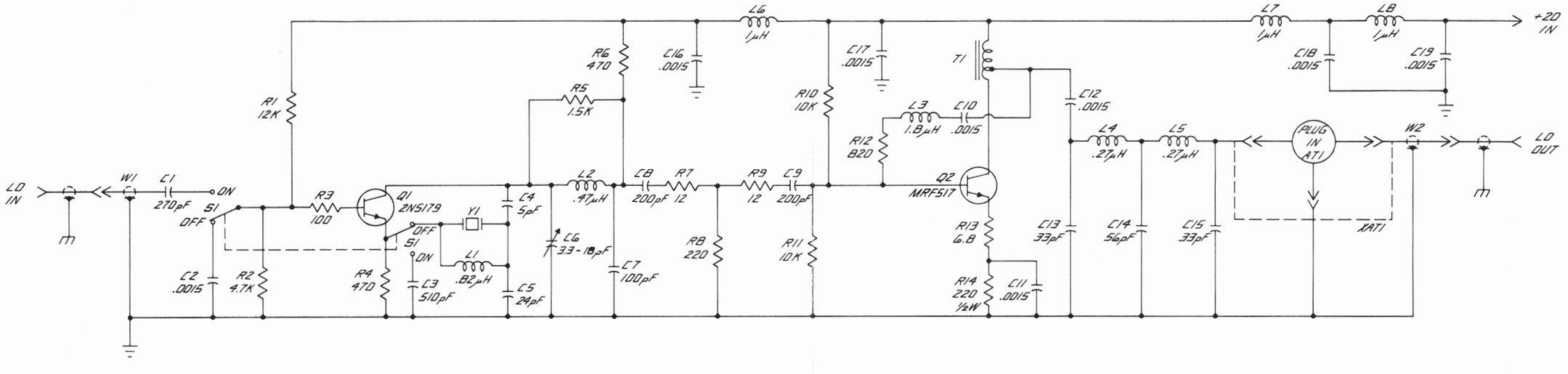
DETAIL B



WIRE CHART			
NO.	COLOR	LENGTH	TYPE
W2	RED	2.75	22 AWG
W3	BLUE	2.75	22 AWG
W4	GRAY	2.75	22 AWG
W5		1.25	UNINSULATED BUSS
W6		1.25	UNINSULATED BUSS

153242F

Figure 8-11. Model 6350
Vestigial Filter
Printed-Wiring Board Assembly

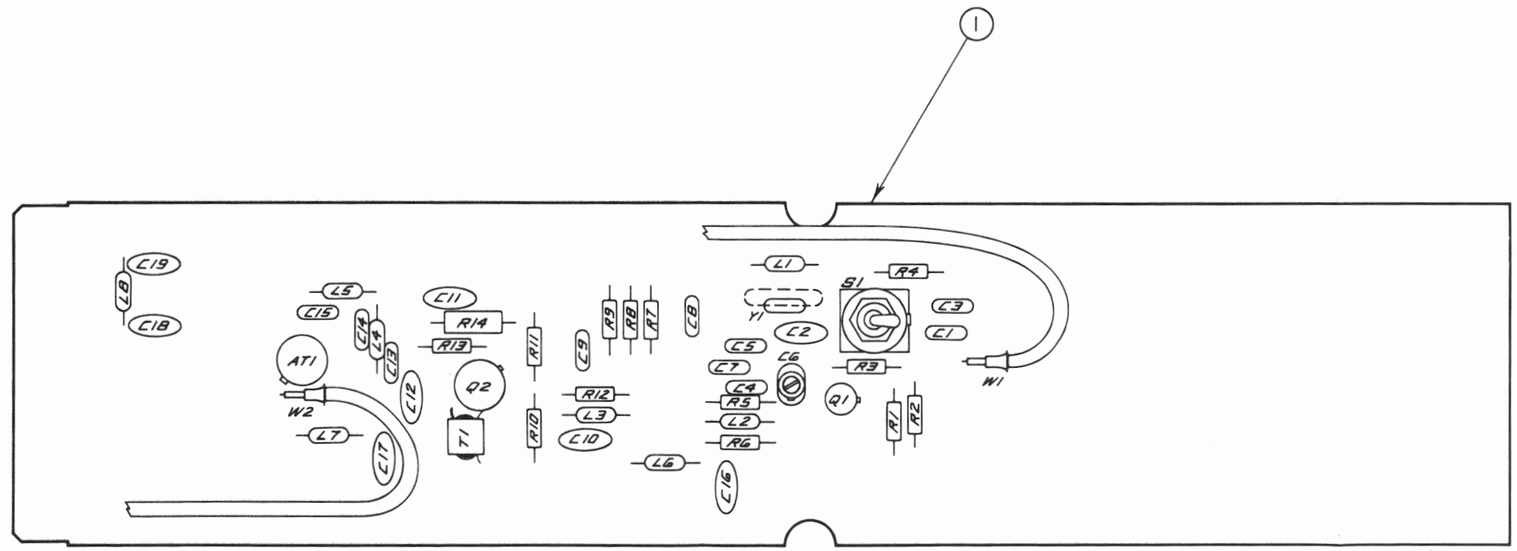


Y1 FREQUENCIES	
CH T7	52.75 MHz
CH T8	58.75 MHz
CH T9	64.75 MHz
CH T10	70.75 MHz
CH T11	76.75 MHz

143087A

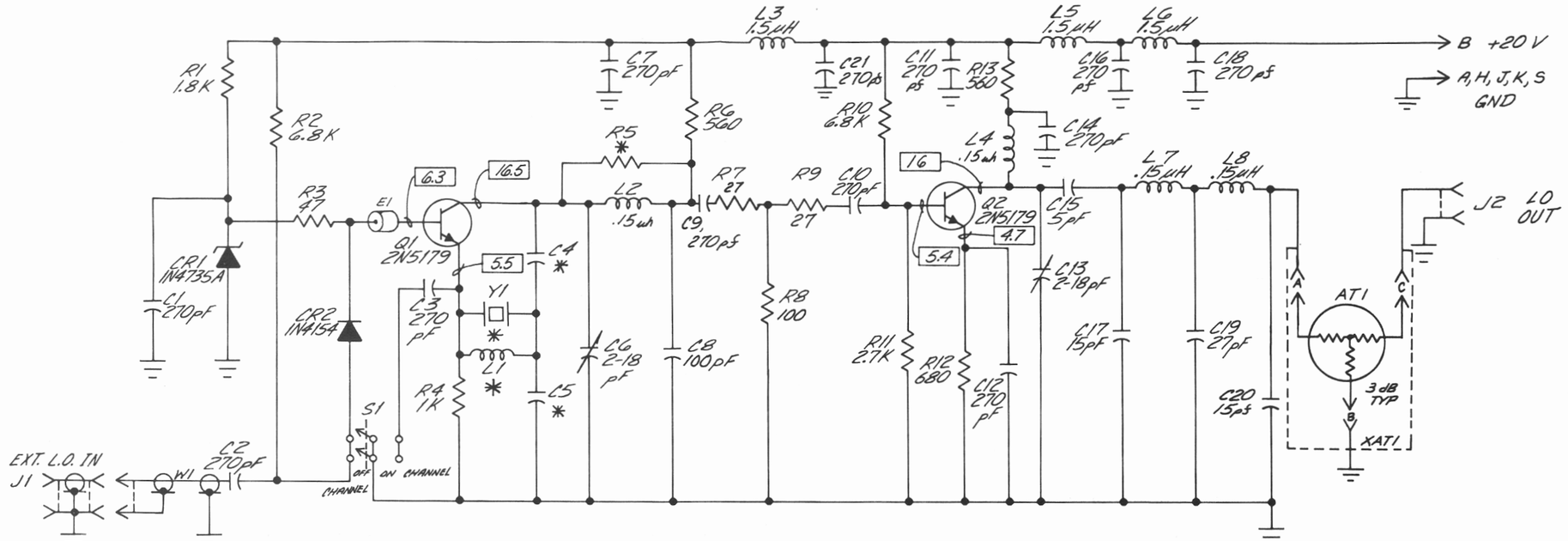
Figure 8-12. Model 6350
Sub-Low Band Output Converter
Local Oscillator Schematic Diagram

25R243B



230907-230911A

Figure 8-13. Model 6350
Sub-Low Band Output Converter
Local Oscillator PW Board Assembly



* CH	C5	C4	Y1	R5	L1
2	47pF	8pf	101 MHz	2.7K	.27μH
3	47pf	8pf	107 MHz	2.7K	.27μH
4	47pF	8pf	113 MHz	2.7K	.27μH
5	33pf	6pf	123 MHz	2.7K	.18μH
6	33pf	6pf	129 MHz	2.7K	.15μH
FM1	33pF	6 pF	135 MHz	2.7K	.15μH
FM2	27pF	5pF	141 MHz	2.7K	.15μH
FM3	24 pF	4 pF	147 MHz	2.7K	.15μH

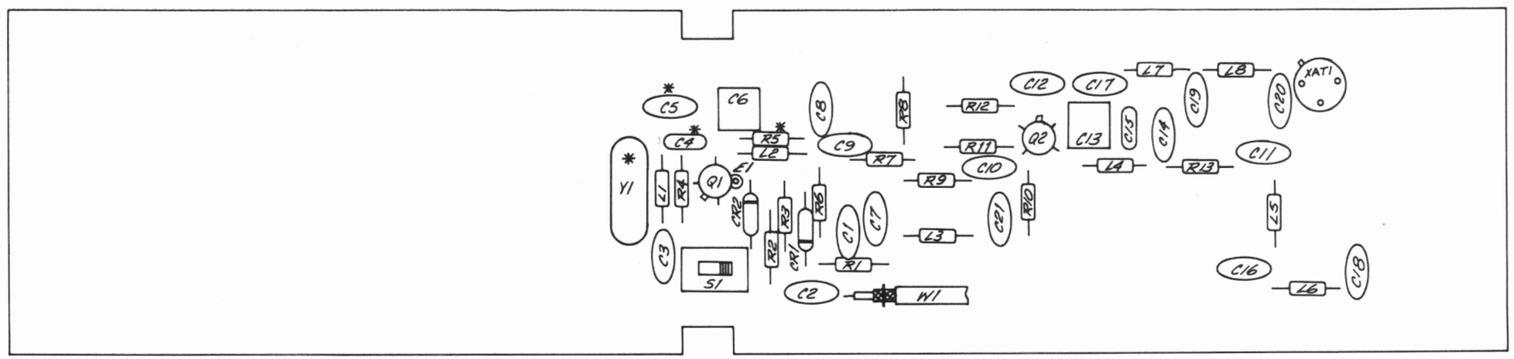
NOTES:

1. VOLTAGE MEASUREMENTS WERE MADE ON PROPERLY OPERATING UNIT WITH S1 IN OFF CHANNEL POSITION.

36130C

Figure 8-14. Model 6350
Low-Band Output Converter
Local Oscillator Schematic Diagram

25R243B

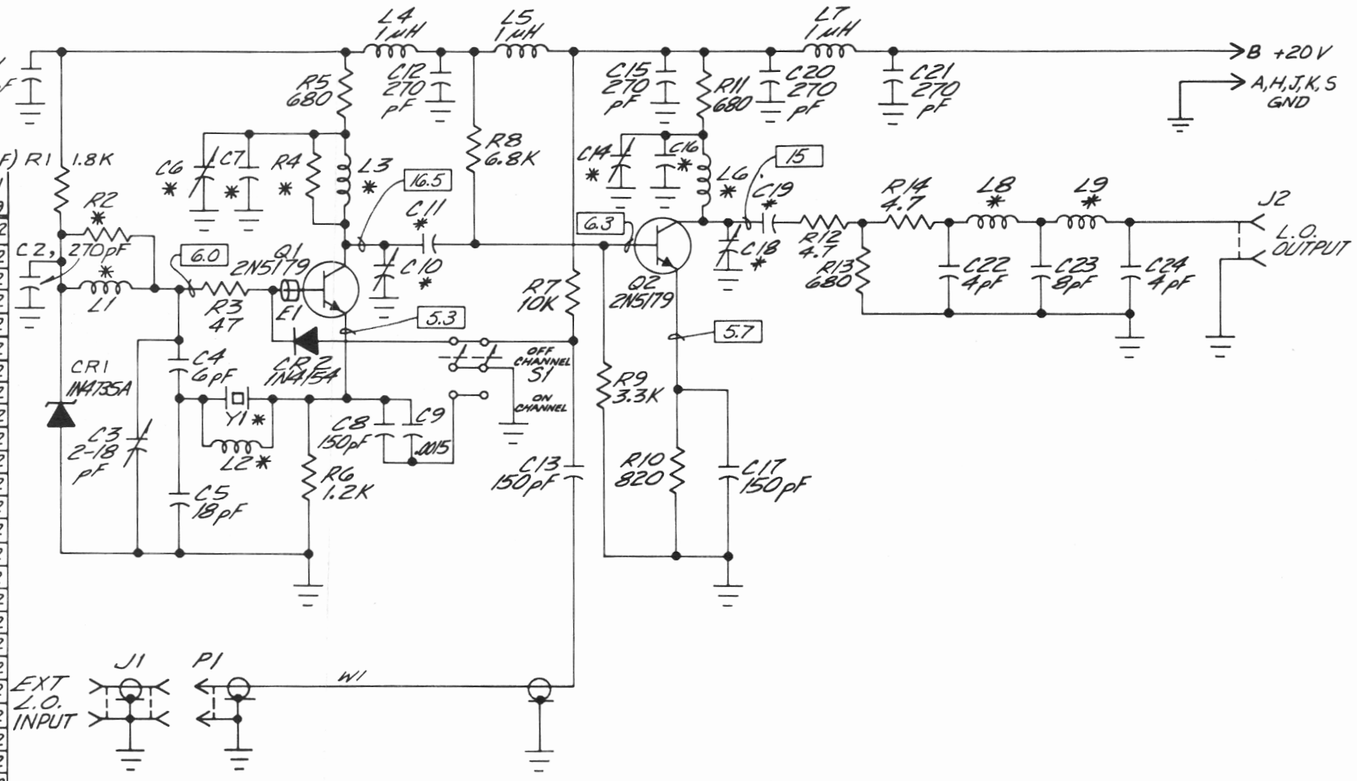


* COMPONENTS THAT CHANGE ACCORDING TO CHANNEL

230302-230306A

Figure 8-15. Model 6350
Low-Band Output Converter
Local Oscillator PW Board Assembly

CH	R2	L2 (μH)	L3* L6 (μH)	L1 (μH)	C6* C7 (pF)	C7* C15 (pF)	Y1 (MHz)	R4	L8 (μH)	L9 (μH)	C10 & C18 (pF)	C11 & C19 (pF)
A	1.5K	.47	.1	.15	2-18	24	83.5	2.7K	.18	.18	2-18	2.2
B	1.5K	.47	.1	.15	2-18	24	86.5	2.7K	.18	.18	2-18	2.2
C	1.5K	.47	.1	.15	2-18	24	89.5	2.7K	.18	.18	2-18	2.2
D	1.5K	.47	.1	.15	2-18	24	92.5	2.7K	.18	.18	2-18	2.2
E	1.5K	.47	.1	.15	2-18	24	95.5	2.7K	.15	.15	2-18	2.2
F	1.5K	.33	.1	.15	2-18	24	98.5	2.7K	.15	.15	2-18	2.2
G	1.5K	.33	.1	.15	2-18	24	101.5	2.7K	.15	.15	2-18	2.2
H	1.5K	.33	.1	.15	2-18	24	104.5	2.7K	.15	.15	2-18	2.2
I	1.5K	.33	.1	.15	2-18	24	107.5	2.7K	.15	.15	2-18	2.2
7	1.8K	.27	.05	.1	OMIT	33	110.5	3.9K	.10	.10	2-18	2.2
8	1.8K	.27	.05	.1	OMIT	33	113.5	3.9K	.10	.10	2-18	2.2
9	1.8K	.27	.05	.1	OMIT	33	116.5	3.9K	.10	.10	2-18	2.2
10	1.8K	.27	.05	.1	OMIT	33	119.5	3.9K	.10	.10	2-18	2.2
11	1.8K	.18	.05	.1	OMIT	33	122.5	3.9K	.10	.10	2-18	2.2
12	1.8K	.18	.05	.1	OMIT	33	125.5	3.9K	.10	.10	2-18	2.2
13	1.8K	.18	.05	.1	OMIT	33	128.5	3.9K	.10	.10	2-18	2.2
J	3.3K	.18	.05	.1	OMIT	24	131.5	OMIT	.10	.10	2-18	2.2
K	3.3K	.15	.05	.1	OMIT	24	134.5	OMIT	.10	.10	2-18	2.2
L	3.3K	.15	.05	.1	OMIT	24	137.5	OMIT	.10	.10	2-18	2.2
M	3.3K	.15	.05	.1	OMIT	24	140.5	OMIT	.10	.10	2-18	2.2
N	3.3K	.15	.05	.1	OMIT	24	143.5	OMIT	.10	.10	2-18	2.2
O	3.3K	.15	.05	.1	OMIT	24	146.5	OMIT	.10	.10	2-18	2.2
P	3.3K	.15	.05	.05	OMIT	20	149.5	OMIT	.10	.10	2-9	2.2
Q	3.3K	.15	.05	.05	OMIT	20	152.5	OMIT	.10	.10	2-9	2.2
R	3.3K	.1	.05	.05	OMIT	20	155.5	OMIT	.05	.05	2-9	2.2
S	3.3K	.1	.05	.05	OMIT	20	158.5	OMIT	.05	.05	2-9	2.2
T	3.3K	.1	.05	.05	OMIT	20	161.5	OMIT	.05	.05	2-9	2.2
U	3.3K	.1	.05	.05	OMIT	20	164.5	OMIT	.05	.05	2-9	1.5
V	3.3K	.1	.05	.05	OMIT	20	167.5	OMIT	.05	.05	2-9	1.5
W	3.3K	.1	.05	.05	OMIT	20	170.5	OMIT	.05	.05	2-9	1.5



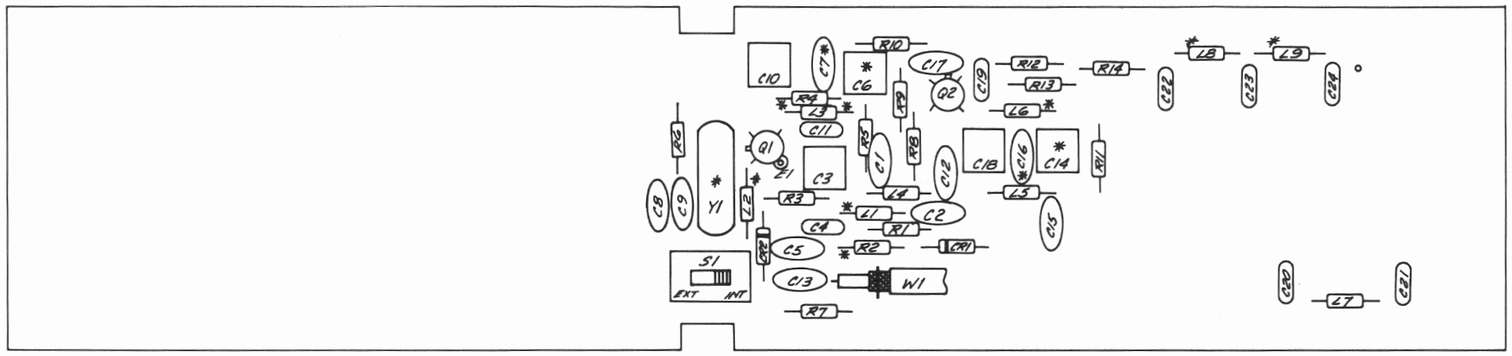
NOTES:

1. VOLTAGE MEASUREMENTS WERE MADE ON A NORMALLY OPERATING UNIT AND MAY VARY ±20%.

36131D

Figure 8-16. Model 6350 Mid, High, and Super-Band Output Converter Local Oscillator Schematic Diagram

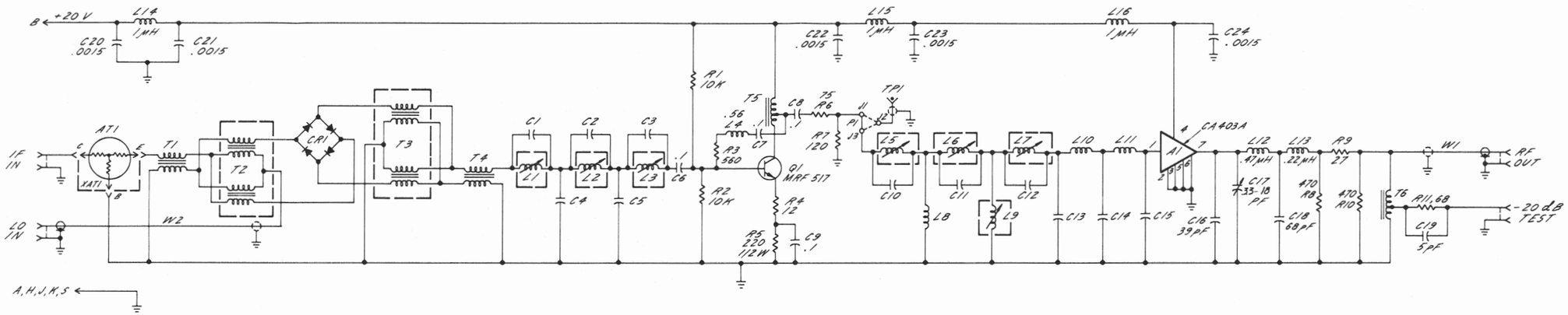
25R243B



* COMPONENTS THAT CHANGE ACCORDING TO CHANNEL

230307-230336A

Figure 8-17. Model 6350 Mid, High, and Super-Band Local Oscillator Printed-Wiring Board Assembly

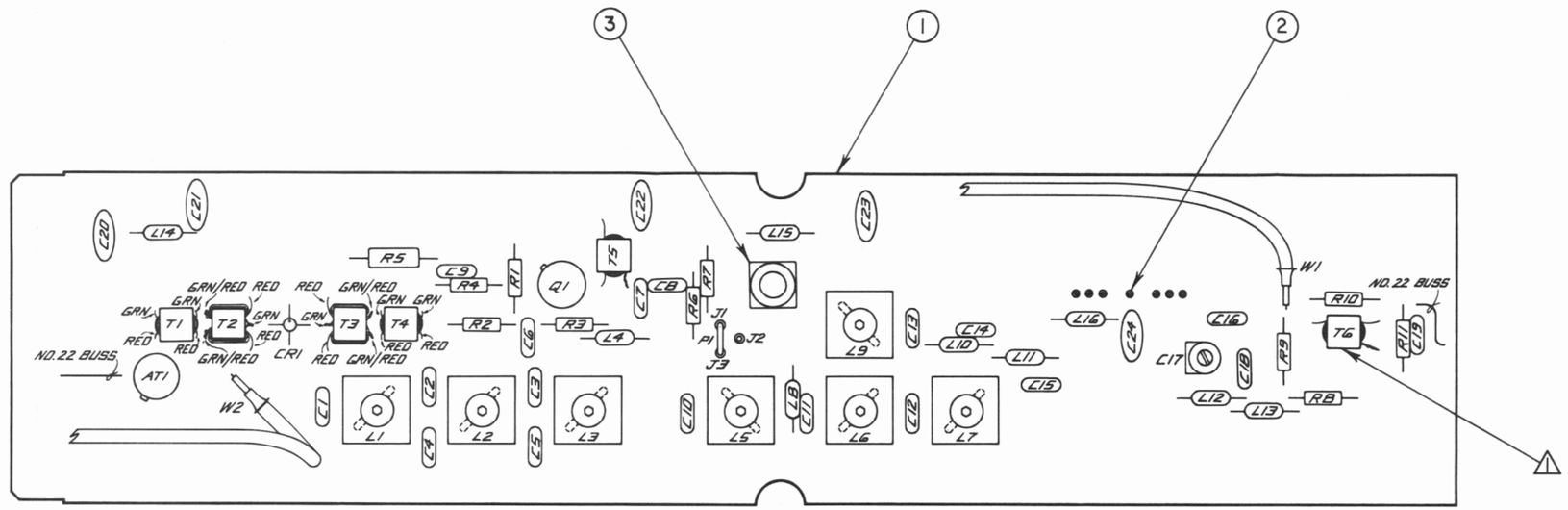


CH	L1	L2	L3	L5	L6	L7	L8	L9	L10	L11	C1	C2	C3	C4	C5	C10	C11	C12	C13	C14	C15
T7	9.5T	14.5T	9.5T	–	–	–	2.7μH	23.5T	1.2μH	1.2	270pF	150	270	180	180	SHORT	390	SHORT	150	270	150
T8	10.5	14.5	10.5	14.5T	23.5T	14.5	1.8	23.5	1	1	82	43	82	150	150	560	300	560	120	200	120
T9	7.5	10.5	7.5	12.5	23.5	12.5	.56	12.5	.68	.68	87	47	87	100	100	200	110	200	82	150	82
T10	6.5	10.5	6.5	11.5	19.5	11.5	.47	10.5	.56	.56	82	43	82	75	75	150	82	150	68	120	68
T11	5.5	8.5	5.5	6.5	14.5	6.5	.33	7.5	.47	.47	68	33	68	75	75	150	68	150	56	100	56

143167B

Figure 8-18. Model 6350
Sub-Low Band Output Converter
Schematic Diagram

25R243C

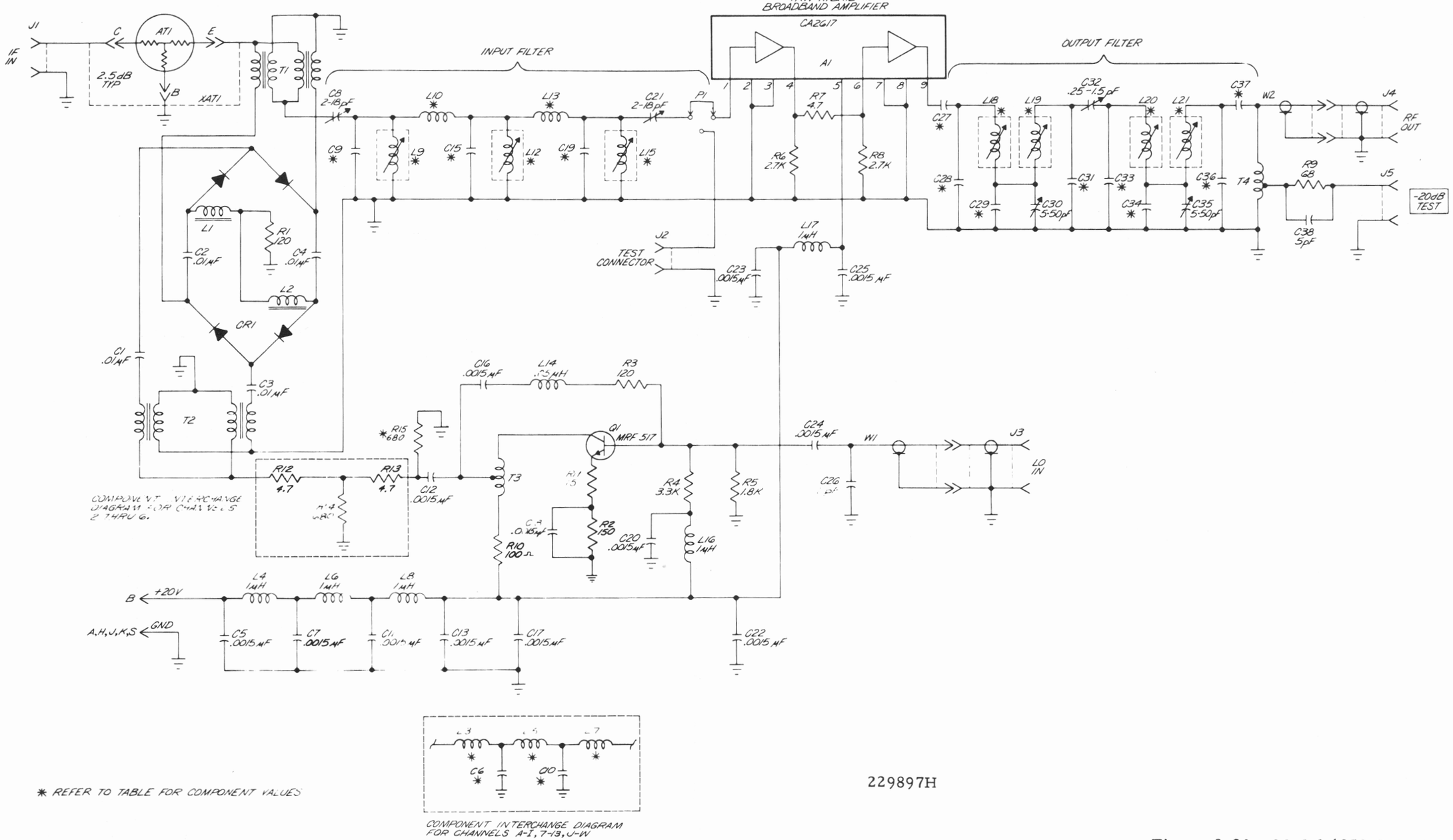


NOTES:

⚠ CORE OF T6 DISTINGUISHABLE BY "X"

230707-230711A

Figure 8-19. Model 6350
Sub-Low Band Output Converter
PW Board Assembly



229897H

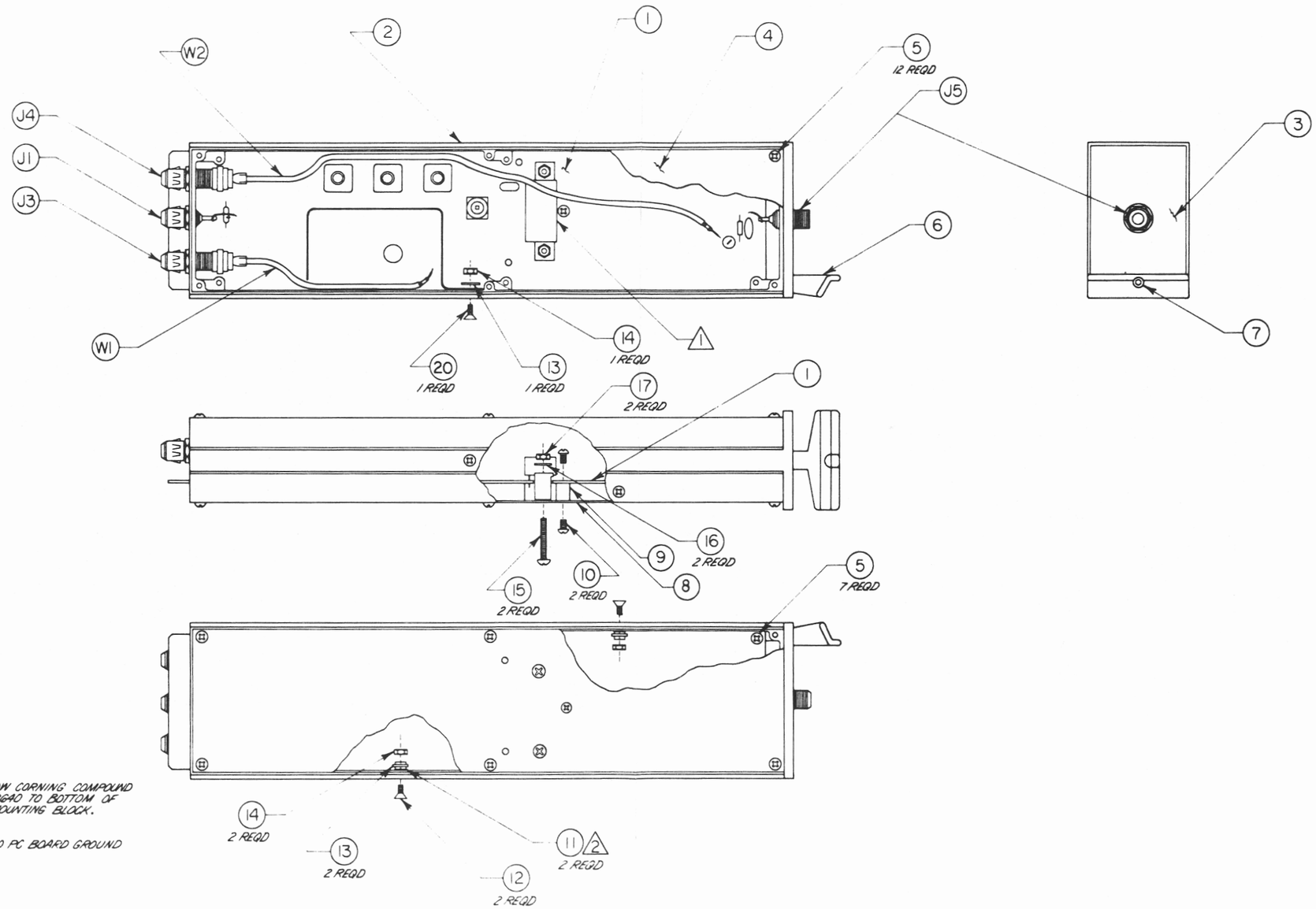
Figure 8-20. Model 6350 Output Converter Schematic Diagram (Sheet 1 of 2)

6150/6350 OUTPUT CONVERTER TABLE

CHANNEL	C6,10	C9,19	C15	C27	C28	C29,34	C31	C33	C36	C37	L3,7	L5	L9,12,15	L10,13	L18,19 20,21	L14	C26	R15
2		20 pF	35 pF	8 pF	OMIT	47 pF	6 pF	6 pF	OMIT	8 pF			6 1/2 T	1.2 μH	17 1/2 T	.05 μH	2 pF	
3		30 pF	47 pF	7 pF	OMIT	47 pF	6 pF	6 pF	OMIT	7 pF			4 1/2 T	1 μH	16 1/2 T	.05 μH	2 pF	
4		30 pF	36 pF	7 pF	OMIT	30 pF	6 pF	6 pF	OMIT	7 pF			4 1/2 T	1 μH	14 1/2 T	.05 μH	2 pF	
5		30 pF	36 pF	7 pF	OMIT	30 pF	6 pF	6 pF	OMIT	7 pF			3 1/2 T	1 μH	11 1/2 T	.05 μH	2 pF	
6		27 pF	33 pF	7 pF	OMIT	30 pF	6 pF	6 pF	OMIT	7 pF			3 1/2 T	1 μH	10 1/2 T	.05 μH	2 pF	
7	11 pF	12 pF	15 pF	5 pF	2.2 pF	OMIT	6 pF	6 pF	2.2 pF	5 pF	.05 μH	.1 μH	2 1/2 T	.68 μH	3 1/2 T	.05 μH	2 pF	
8	11 pF	10 pF	15 pF	5 pF	2.2 pF	OMIT	6 pF	6 pF	2.2 pF	5 pF	.05 μH	.1 μH	2 1/2 T	.68 μH	3 1/2 T	.05 μH	2 pF	
9	10 pF	12 pF	18 pF	4 pF	4 pF	OMIT	7 pF	7 pF	4 pF	4 pF	.05 μH	.1 μH	1 1/2 T	.68 μH	2 1/2 T	.05 μH	2 pF	
10	10 pF	12 pF	15 pF	4 pF	4 pF	OMIT	7 pF	7 pF	4 pF	4 pF	.05 μH	.1 μH	1 1/2 T	.56 μH	2 1/2 T	.05 μH	2 pF	
11	8.2 pF	11 pF	14 pF	4 pF	4 pF	OMIT	7 pF	7 pF	4 pF	4 pF	.05 μH	.1 μH	1 1/2 T	.56 μH	2 1/2 T	.05 μH	2 pF	
12	7.5 pF	11 pF	14 pF	4 pF	4 pF	OMIT	7 pF	7 pF	4 pF	4 pF	.05 μH	.1 μH	1 1/2 T	.56 μH	2 1/2 T	.05 μH	2 pF	
13	6.8 pF	11 pF	14 pF	4 pF	4 pF	OMIT	7 pF	7 pF	4 pF	4 pF	.05 μH	.1 μH	1 1/2 T	.56 μH	2 1/2 T	.05 μH	2 pF	
A	15 pF	18 pF	23 pF	6 pF	1 pF	30 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.15 μH	2 1/2 T	.82 μH	6 1/2 T	.05 μH	2 pF	680 Ω
B	14 pF	15 pF	20 pF	6 pF	1 pF	30 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.15 μH	2 1/2 T	.82 μH	6 1/2 T	.05 μH	2 pF	680 Ω
C	13 pF	15 pF	19 pF	6 pF	1 pF	30 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.15 μH	2 1/2 T	.82 μH	5 1/2 T	.05 μH	2 pF	680 Ω
D	13 pF	15 pF	19 pF	6 pF	1 pF	30 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.15 μH	2 1/2 T	.82 μH	5 1/2 T	.05 μH	2 pF	680 Ω
E	14 pF	13 pF	17 pF	6 pF	1 pF	15 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.12 μH	2 1/2 T	.82 μH	4 1/2 T	.05 μH	2 pF	680 Ω
F	13 pF	13 pF	17 pF	6 pF	1 pF	15 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.12 μH	2 1/2 T	.82 μH	4 1/2 T	.05 μH	2 pF	680 Ω
G	13 pF	13 pF	17 pF	6 pF	1 pF	15 pF	6 pF	6 pF	1 pF	6 pF	.1 μH	.12 μH	2 1/2 T	.68 μH	4 1/2 T	.05 μH	2 pF	680 Ω
H	13 pF	12 pF	15 pF	5 pF	2.2 pF	OMIT	6 pF	6 pF	2.2 pF	5 pF	.05 μH	.12 μH	2 1/2 T	.68 μH	3 1/2 T	.05 μH	2 pF	
I	12 pF	12 pF	15 pF	5 pF	2.2 pF	OMIT	6 pF	6 pF	2.2 pF	5 pF	.05 μH	.12 μH	2 1/2 T	.68 μH	3 1/2 T	.05 μH	2 pF	
J	6.2 pF	9.1 pF	12 pF	3 pF	4 pF	OMIT	5 pF	5 pF	4 pF	3 pF	.05 μH	.1 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
K	5.6 pF	9.1 pF	12 pF	3 pF	4 pF	OMIT	5 pF	5 pF	4 pF	3 pF	.05 μH	.1 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
L	4.3 pF	8.2 pF	11 pF	3 pF	3 pF	OMIT	5 pF	5 pF	3 pF	3 pF	.05 μH	.1 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
M	4 pF	8.2 pF	11 pF	3 pF	3 pF	OMIT	5 pF	5 pF	3 pF	3 pF	.05 μH	.1 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
N	3.6 pF	8.2 pF	11 pF	3 pF	2 pF	OMIT	4 pF	4 pF	2 pF	3 pF	.05 μH	.1 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
O	11 pF	7.5 pF	10 pF	3 pF	2 pF	OMIT	4 pF	4 pF	2 pF	3 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
P	10 pF	7.5 pF	10 pF	3 pF	2 pF	OMIT	4 pF	4 pF	2 pF	3 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
Q	10 pF	7.5 pF	10 pF	3 pF	2 pF	OMIT	4 pF	4 pF	2 pF	3 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
R	10 pF	6.8 pF	9.1 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
S	10 pF	6.8 pF	9.1 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
T	9 pF	6.0 pF	9.1 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
U	9 pF	5.6 pF	8.2 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
V	9 pF	5.6 pF	7.5 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	
W	9 pF	5.1 pF	7.5 pF	2.2 pF	2 pF	OMIT	3 pF	3 pF	2 pF	2.2 pF	.05 μH	.05 μH	1 1/2 T	.47 μH	2 1/2 T	.05 μH	2 pF	

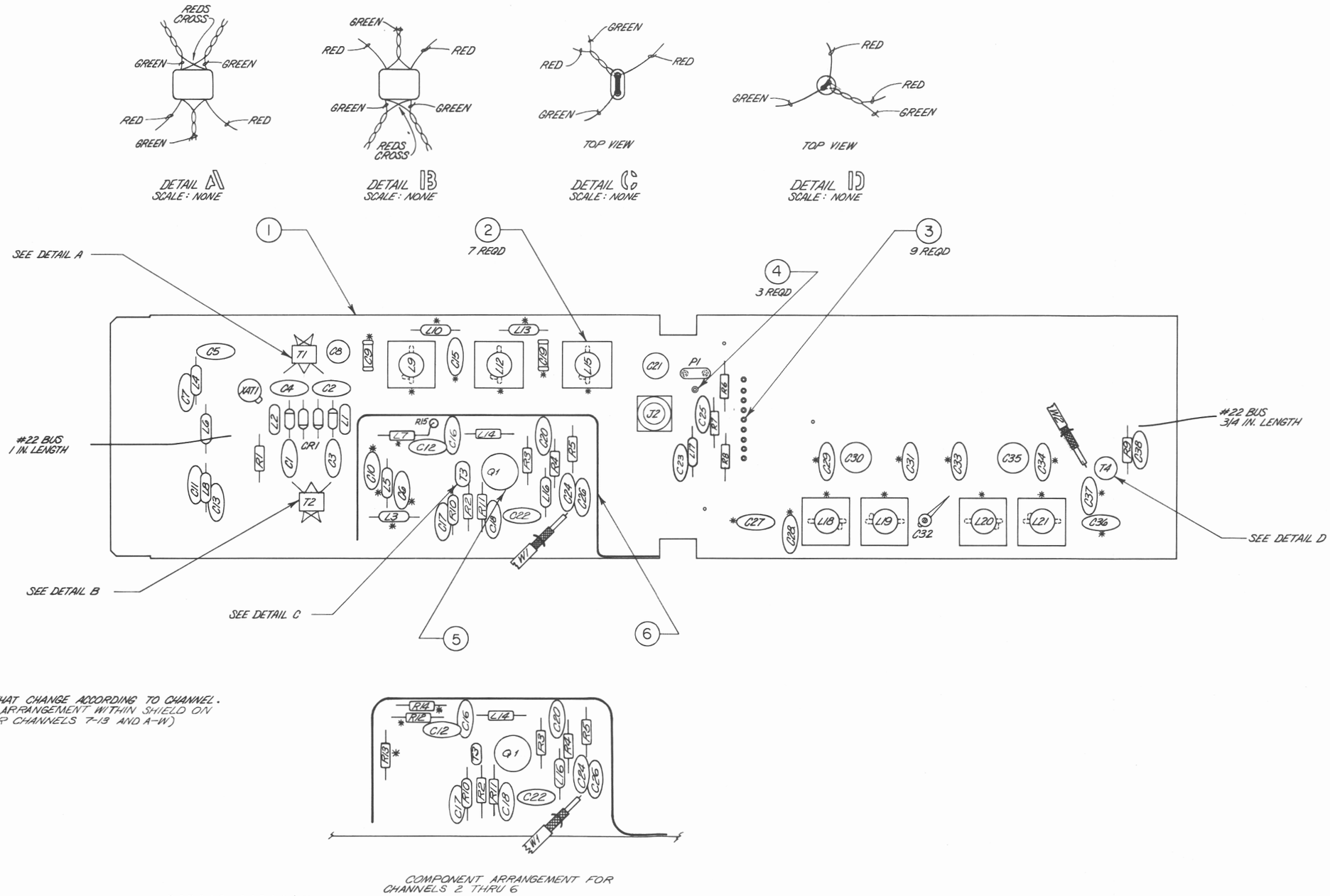
229897H

Figure 8-20. Model 6350 Output Converter Schematic Diagram (Sheet 2 of 2)



229860-229894C

Figure 8-21. Model 6350 Output Converter Module Assembly, Low Band Through Super Band

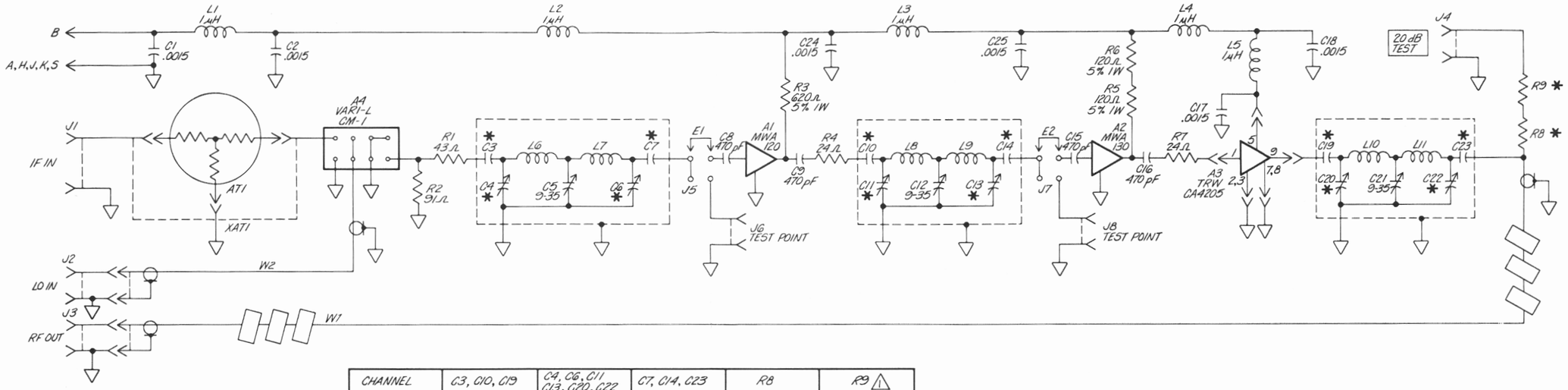


* COMPONENTS THAT CHANGE ACCORDING TO CHANNEL. (COMPONENT ARRANGEMENT WITHIN SHIELD ON PWB ARE FOR CHANNELS 7-13 AND A-W)

COMPONENT ARRANGEMENT FOR CHANNELS 2 THRU 6

231302-231336C

Figure 8-22. Model 6350 Output Converter PW Board Assembly

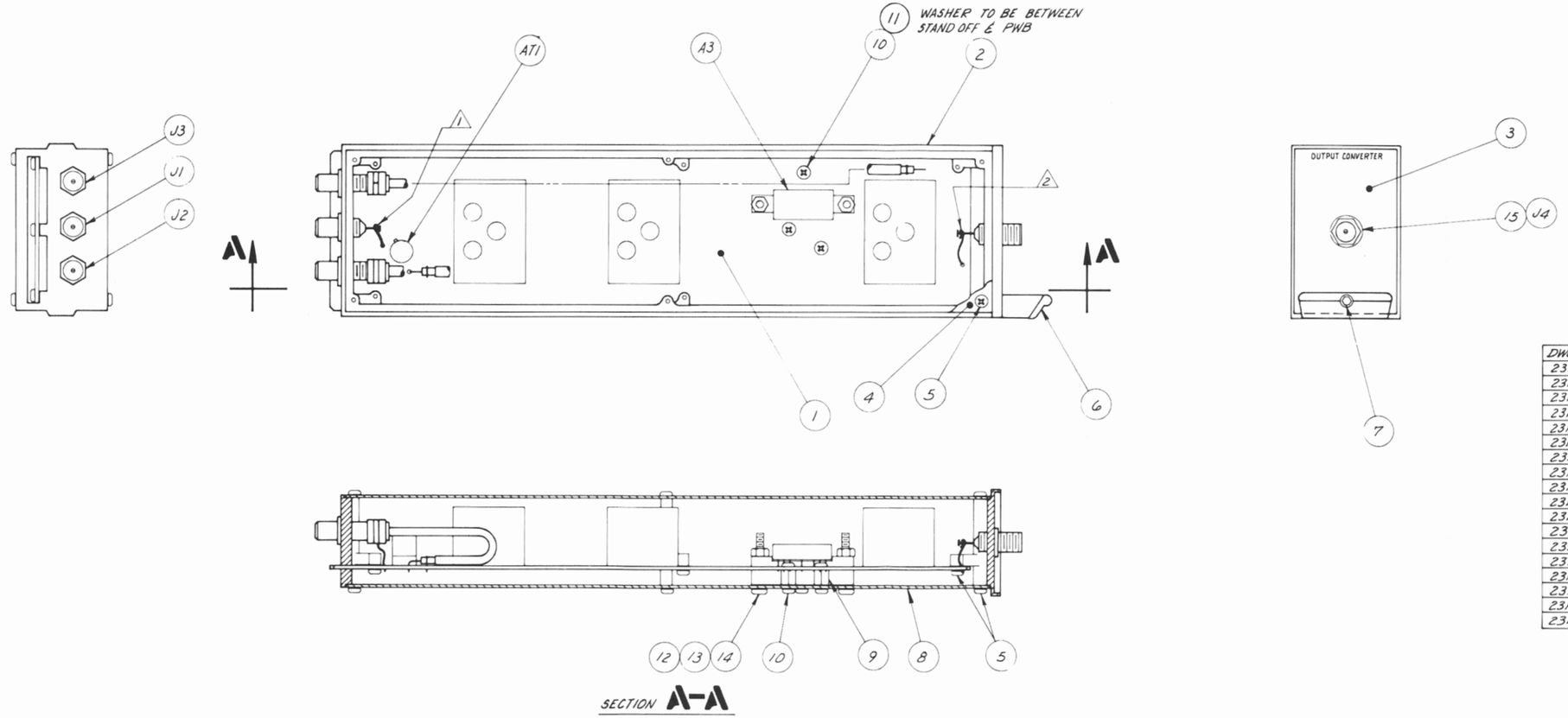


CHANNEL	C3, C10, C19	C4, C6, C11 C13, C20, C22	C7, C14, C23	R8	R9 ⚠1
CH AA 232180	2.7 pF 82003	2-8 pF 79143	4 pF 35TG0	665Ω 78916	733/8
CH BB 232181	2.7 pF 82003	2-8 pF 79143	4 pF 35TG0	665Ω 78916	733/8
CH CC 232182	2.7 pF 82003	2-8 pF 79143	4 pF 35TG0	665Ω 78916	733/8
CH DD 232183	2.7 pF 82003	2-8 pF 79143	4 pF 35TG0	665Ω 78916	733/8
CH EE 232184	2.2 pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH FF 232185	2.2pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH GG 232186	2.2 pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH HH 232187	2.2 pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH II 232188	2.2 pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH JJ 232189	2.2 pF 77501	2-8 pF 79143	3.3 pF 82004	619Ω 83879	733/8
CH KK 232190	2 pF 73487	2-8 pF 79143	3 pF 76380	604Ω 79126	733/8
CH LL 232191	2 pF 73487	2-8 pF 79143	3 pF 76380	604Ω 79126	733/8
CH MM 232192	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	562Ω 83878	733/8
CH NN 232193	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	562Ω 83878	733/8
CH OO 232194	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	562Ω 83878	733/8
CH PP 232195	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	562Ω 83878	733/8
CH QQ 232196	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	540Ω 83877	733/8
CH RR 232197	1.5 pF 76381	1.3-5.4 pF 83007	2.2 pF 77501	540Ω 83877	733/8

NOTE:
⚠1 733/8 IS BUSS WIRE.

231973A

Figure 8-23. Hyperband Output Converter Schematic Diagram



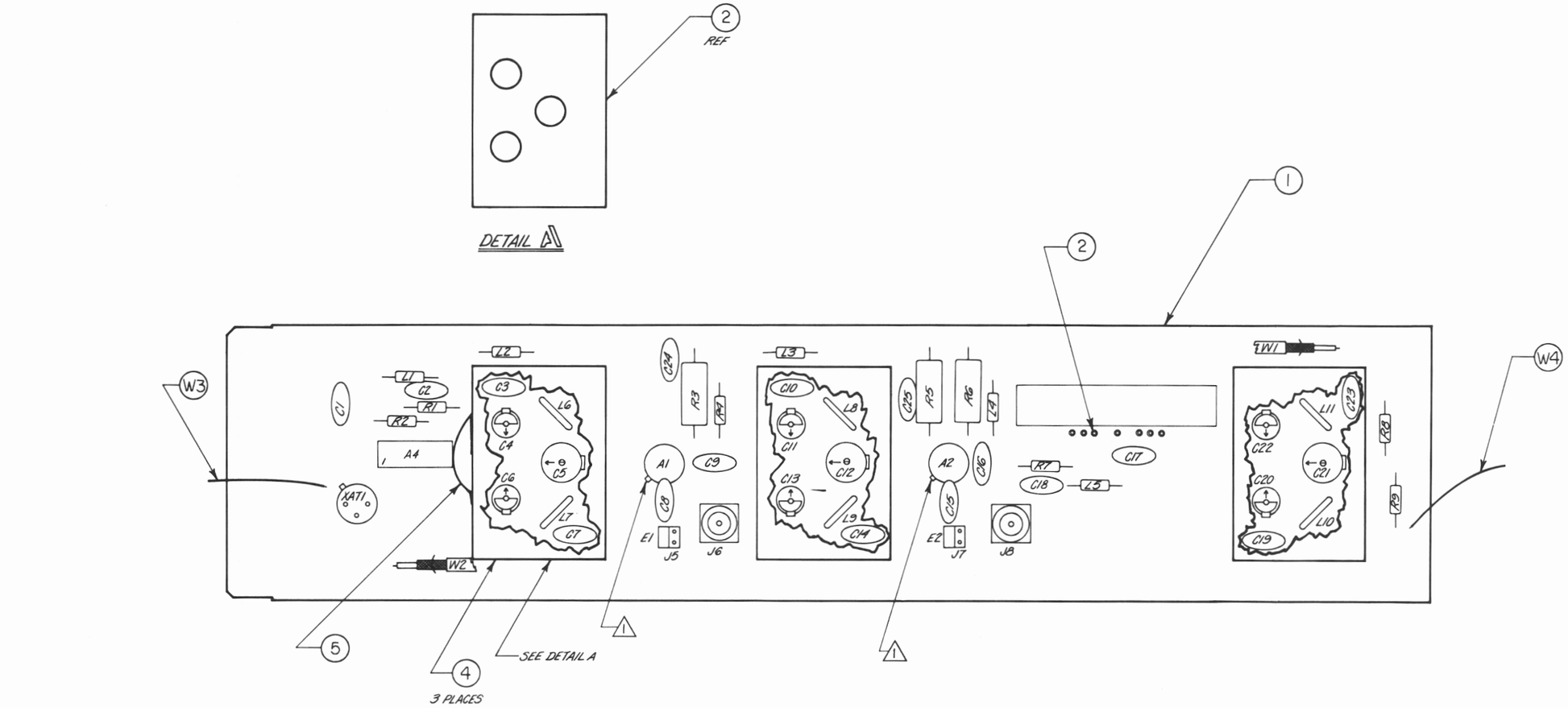
DWG NO.	OUTPUT CONV
231580	CHANNEL AA
231581	CHANNEL BB
231582	CHANNEL CC
231583	CHANNEL DD
231584	CHANNEL EE
231585	CHANNEL FF
231586	CHANNEL GG
231587	CHANNEL HH
231588	CHANNEL II
231589	CHANNEL JJ
231590	CHANNEL KK
231591	CHANNEL LL
231592	CHANNEL MM
231593	CHANNEL NN
231594	CHANNEL OO
231595	CHANNEL PP
231596	CHANNEL QQ
231597	CHANNEL RR

NOTE:

1. SOLDER W3 (REF DWG 231970) TO J1.
2. SOLDER W4 (REF DWG 231970) TO J4.

231580-231597

Figure 8-24. Hyperband Output Converter Module Assembly



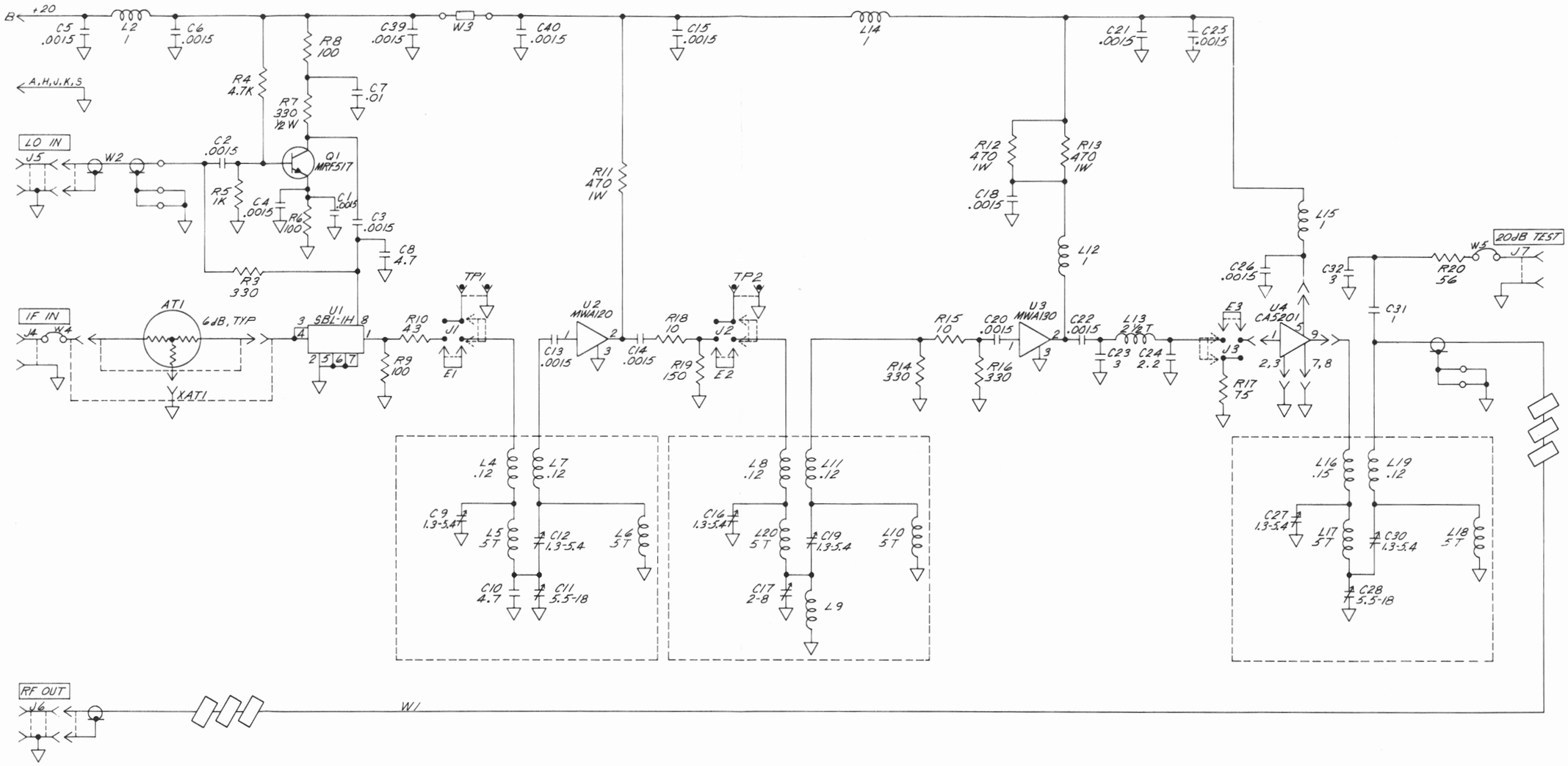
NOTES:

1. "SOLDER HYBRID TAB TO GROUND PLANE."

SEE SEPARATE PARTS LIST

232180-232197A

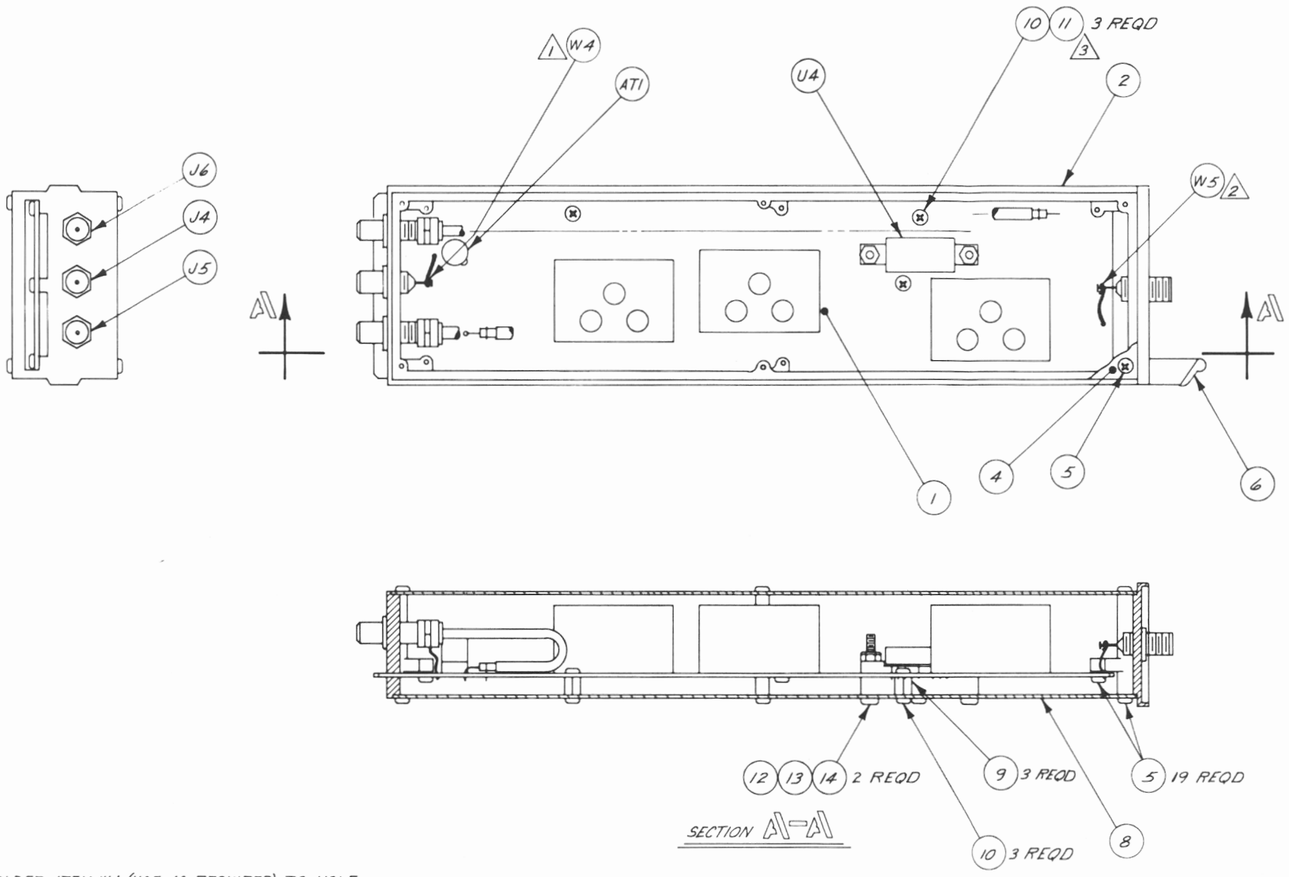
Figure 8-25. Hyperband Output Converter PWB Assembly

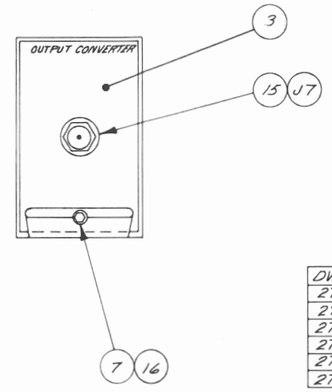


NOTE:
1. L9 IS PRINTED ON PWB.

275154

Figure 8-26. Extended Hyperband Output Converter Schematic Diagram (Channels RR - WW)





DWG NO.	OUTPUT CONV
275137	CHANNEL RR
275138	CHANNEL SS
275139	CHANNEL TT
275140	CHANNEL UU
275141	CHANNEL VV
275142	CHANNEL WW

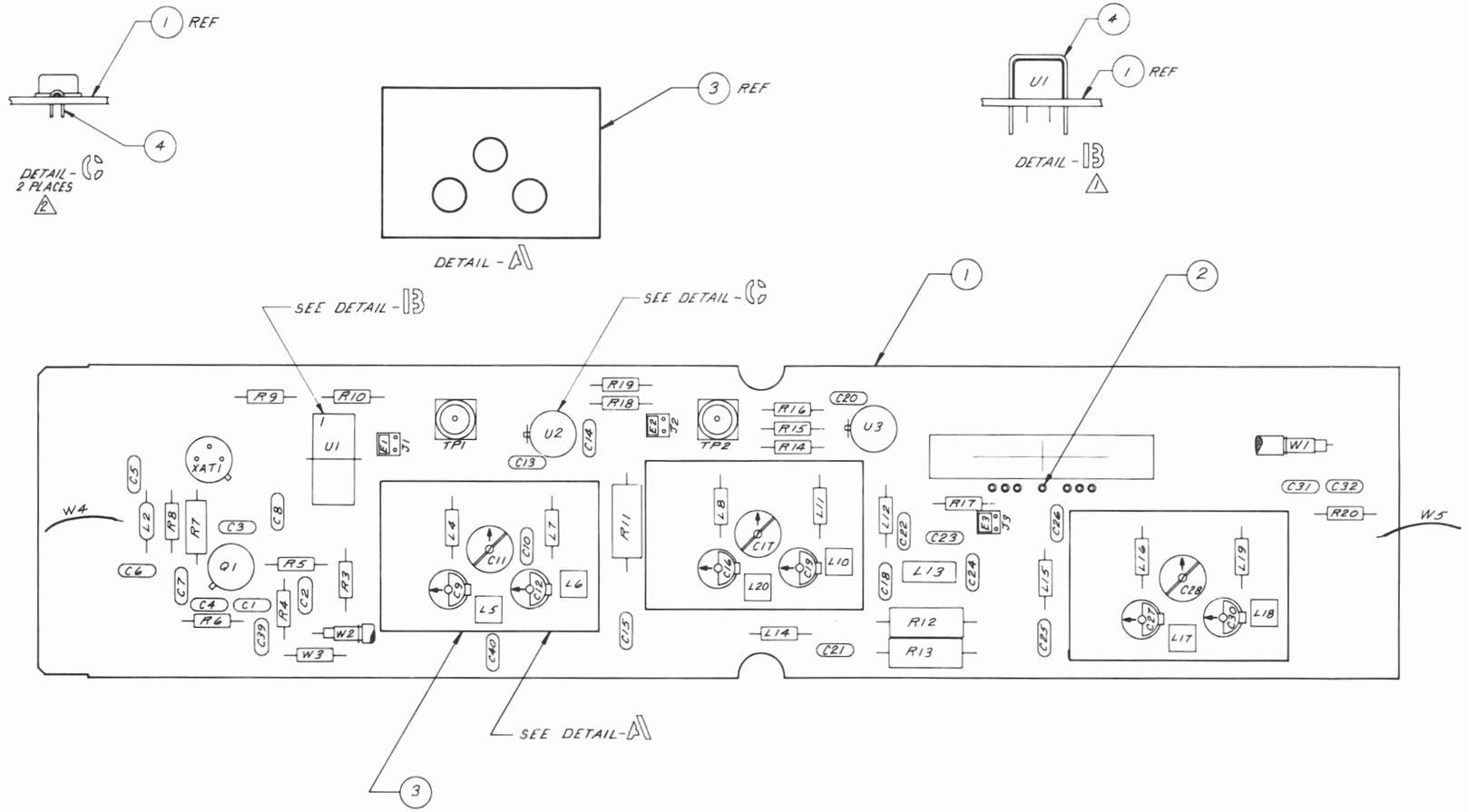
NOTE:

1. SOLDER ITEM W4 (USE AS REQUIRED) TO HOLE IN ITEM 1 AND TO J4.
2. SOLDER ITEM W5 (USE AS REQUIRED) TO HOLE IN ITEM 1 AND TO J7.
3. WASHER TO BE BETWEEN STANDOFF AND PWB.

SEE SEPARATE PARTS LIST

275137-275142

Figure 8-27. Extended Hyperband Output Converter Module Assembly (Channels RR - WW)



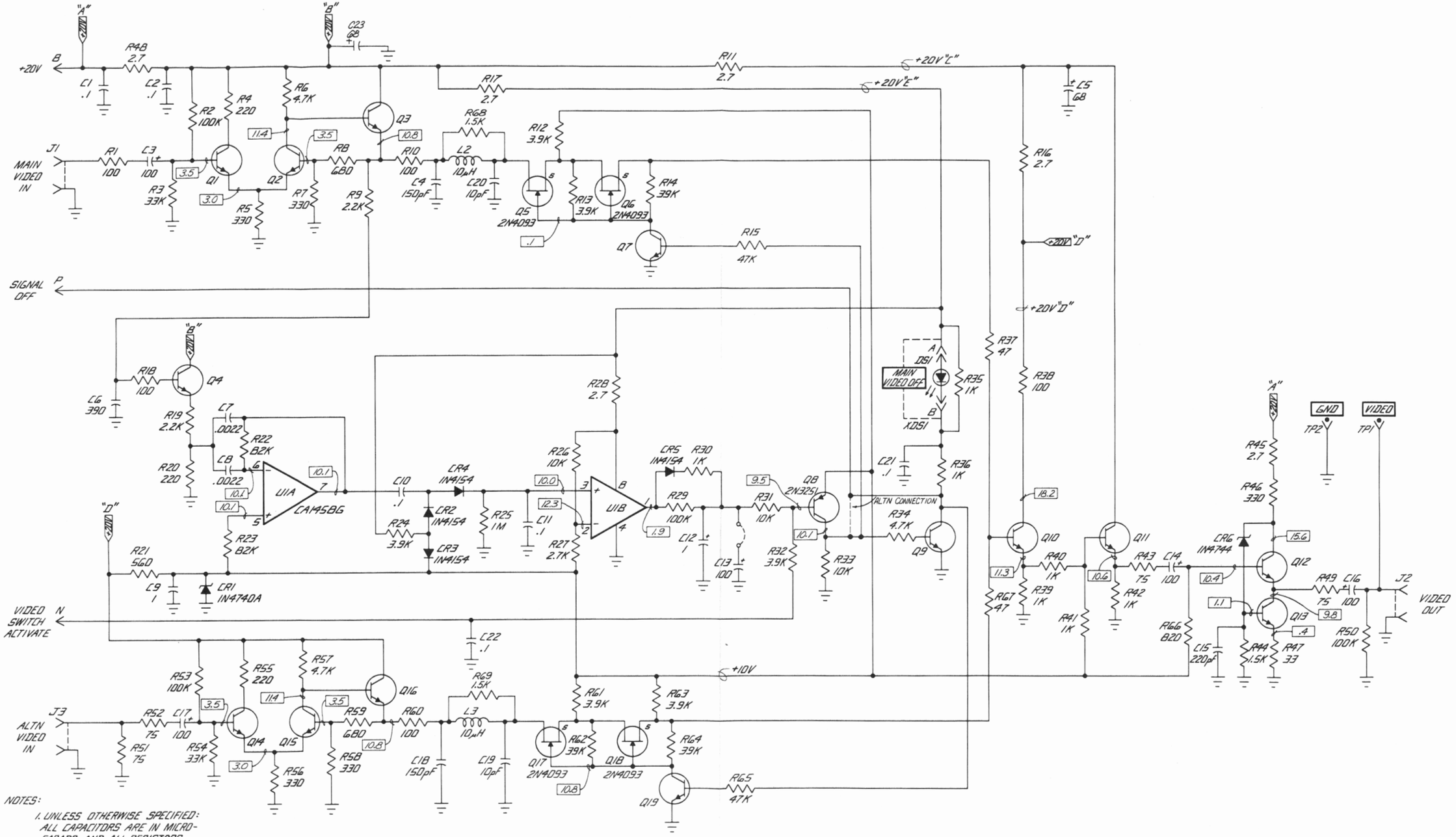
NOTES:

1. LOOP ITEM 4 OVER U1 AS SHOWN AND SOLDER ITEM 4 TO THE TOP OF U1.
2. LOOP ITEM 4 OVER THE ALIGNMENT TABS OF U2 AND U3 AND SOLDER TO TAB.

SEE SEPARATE PARTS LIST

275153

Figure 8-28. Extended Hyperband Output Converter PWB Assembly (Channels RR - WW)



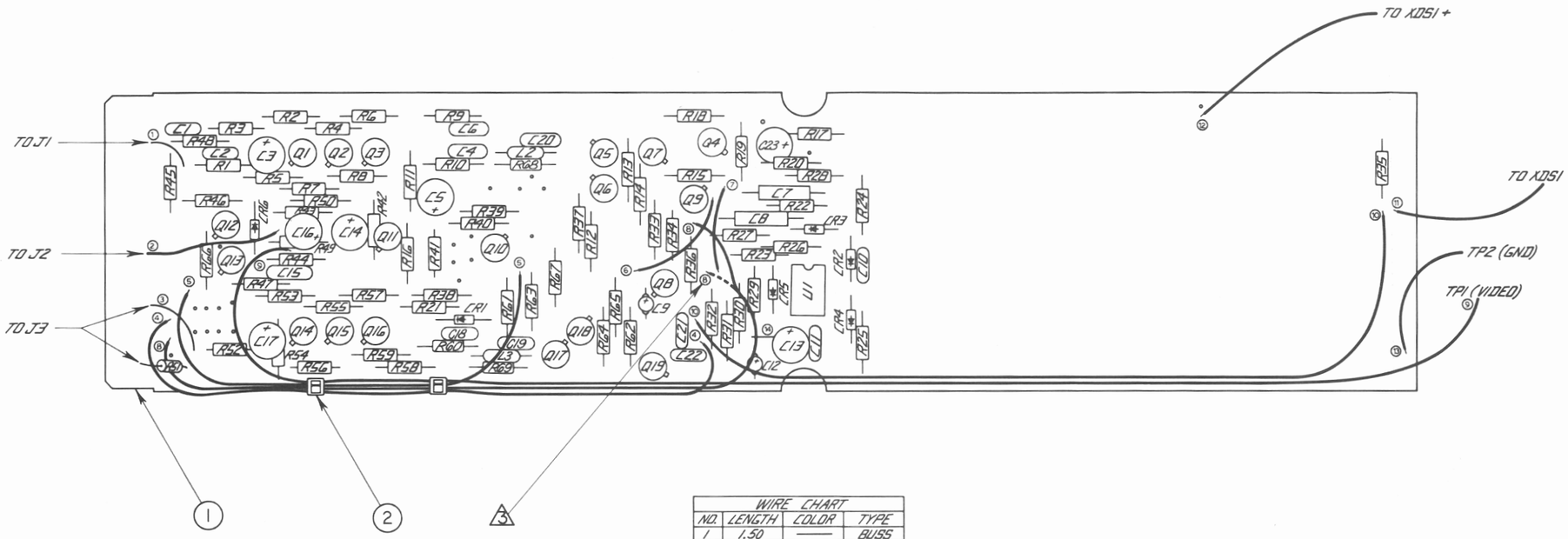
NOTES:

1. UNLESS OTHERWISE SPECIFIED: ALL CAPACITORS ARE IN MICROFARADS AND ALL RESISTORS ARE IN OHMS ±10% AND ¼ WATT.
2. UNLESS OTHERWISE SPECIFIED: ALL TRANSISTORS ARE 2N3947.
3. VOLTAGE MEASUREMENTS ARE MADE WITH NO INPUT SIGNAL, AND MAY VARY ±20%.

164222A

Figure 8-29. Model 6350 Video Switch Schematic Diagram

25R243D



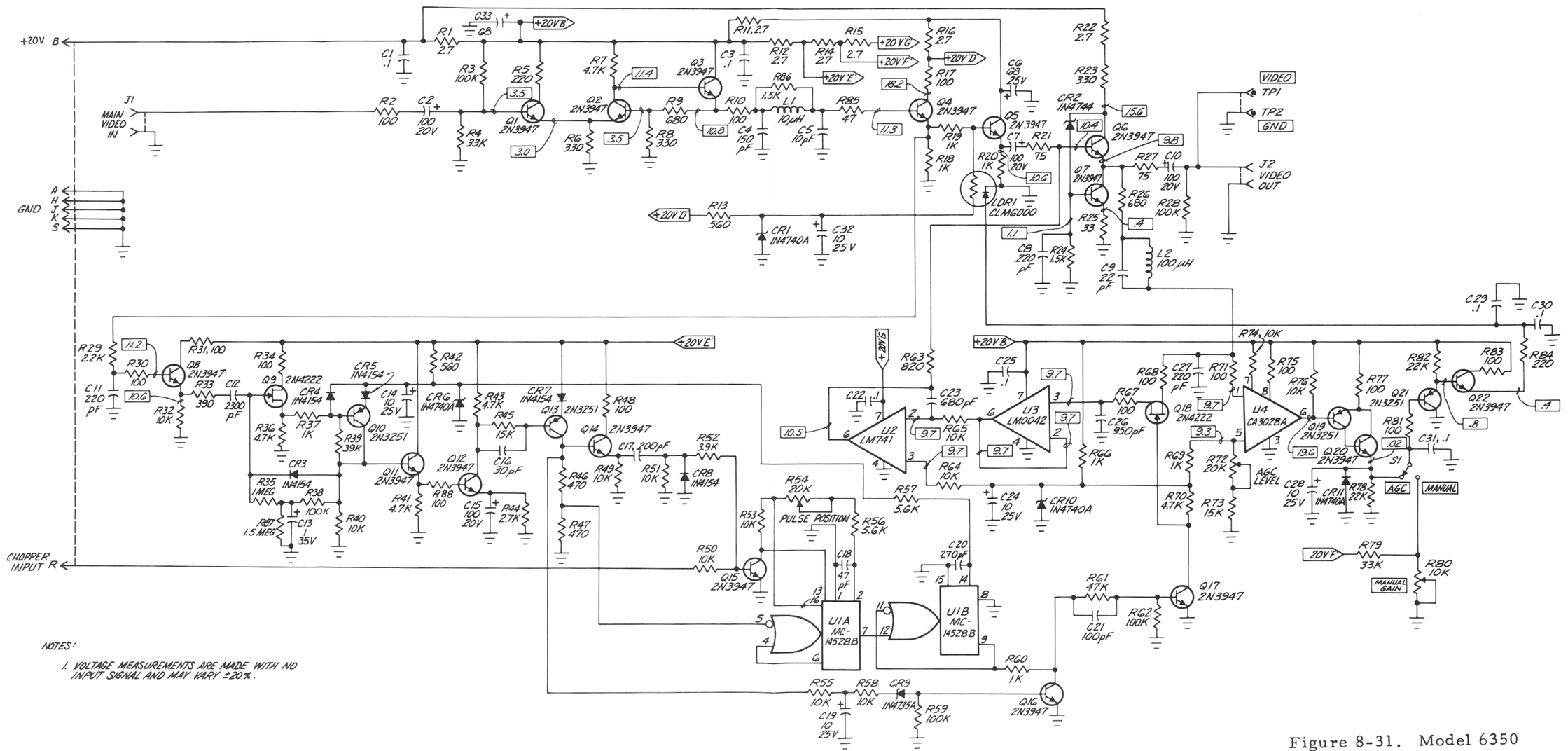
WIRE CHART			
NO.	LENGTH	COLOR	TYPE
1	1.50	——	BUSS
2	1.25	——	INSUL BUSS
3	1.50	——	BUSS
4	6.50	PINK	22 AWG
5	5.0	WHITE	22 AWG
6	1.50	WHITE	22 AWG
7	1.25	WHITE	22 AWG
8	7.0	ORANGE	22 AWG
9	13.0	GRAY	22 AWG
10	8.0	BLUE	22 AWG
11	2.0	BLUE	22 AWG
12	2.0	PINK	22 AWG
13	2.0	BLACK	22 AWG
14	1.0	——	BUSS

NOTES:

1. R52, R41 AND R34 ARE ON .40 SPACING.
2. L1 NOT USED
3. REFER TO INSTRUCTION MANUAL PARAGRAPH 3.8.1 FOR USE OF ALTERNATE CONNECTION.

164221C

Figure 8-30. Model 6350
Video Switch PW Board Assembly



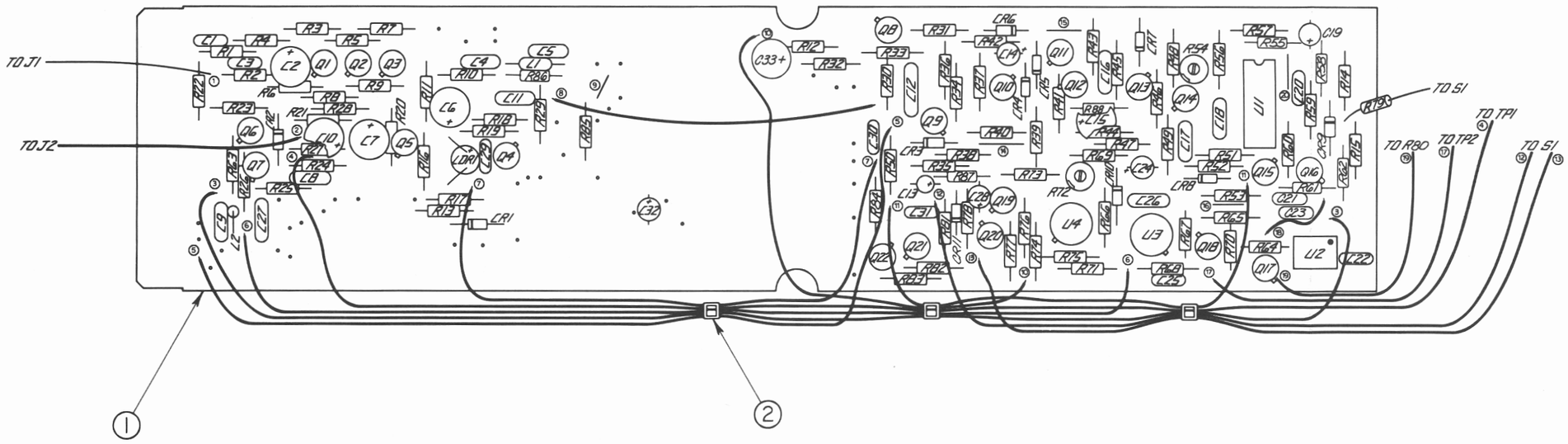
NOTES:

1. VOLTAGE MEASUREMENTS ARE MADE WITH NO INPUT SIGNAL AND MAY VARY ±20%.

164232C

Figure 8-31. Model 6350 Video AGC Schematic Diagram

WIRE CHART			
NO.	COLOR	LENGTH	TYPE
1	——	1.0	BUSS
2	——	1.25	INSUL BUSS
3	WHITE	11.50	22 AWG
4	GRAY	13.0	22 AWG
5	D. BLUE	8.0	22 AWG
6	VIOLET	8.75	22 AWG
7	ORANGE	6.0	22 AWG
8	GOLD	3.25	22 AWG
9	——	.75	BUSS
10	L. GREEN	4.75	22 AWG
11	GOLD	5.25	22 AWG
12	PINK	6.0	22 AWG
13	ORANGE	6.0	22 AWG
14	——	1.0	BUSS
15	——	.75	BUSS
16	——	.75	BUSS
17	BLACK	3.50	22 AWG
18	GRAY	1.25	22 AWG
19	BLACK	1.50	22 AWG
20	——	.75	BUSS



NOTES:

1. RG2, RG4, RG7 AND RT0 ARE ON .40 SPACING.

164231C

Figure 8-32. Model 6350 Video AGC PW Board Assembly

NOTES:

1- R29, R32, R84, R126 ARE NOT ASSIGNED

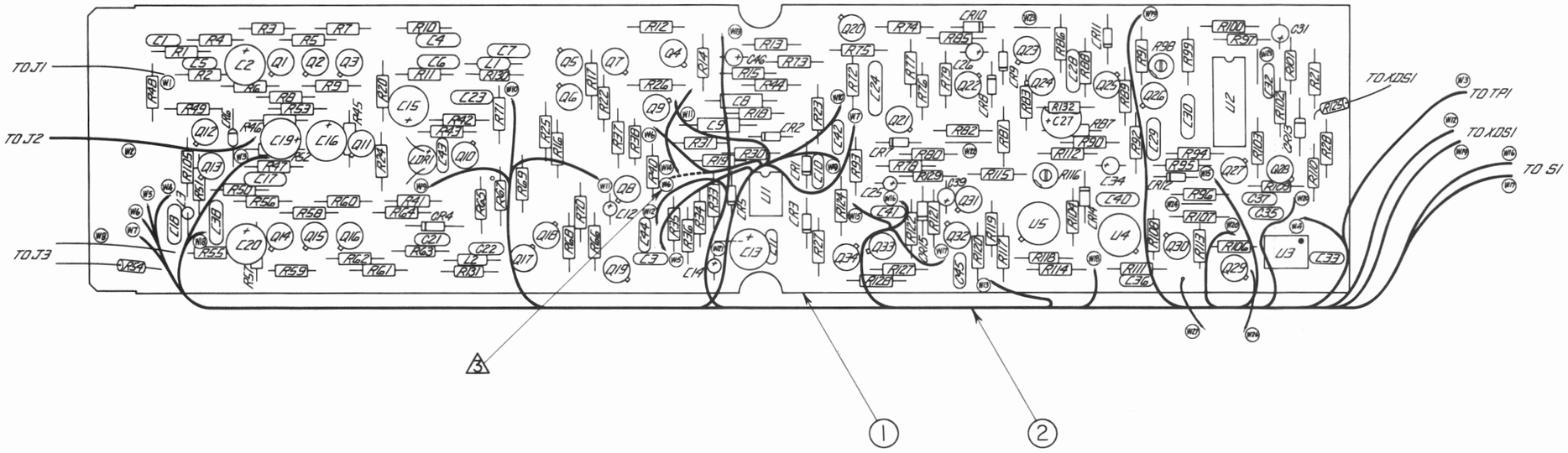
2- VOLTAGE MEASUREMENTS ARE MADE WITH NO INPUT SIGNAL AND MAY VARY ±20%.

153203D

Figure 8-33. Model 6350 Video Switch and AGC Schematic Diagram

25R243D

WIRE CHART			
NO.	COLOR	LENGTH	TYPE
W 1	——	1.00	BUSS
W 2	WHITE	1.50	22 AWG
W 3	GRAY	——	——
W 4	WHITE	——	——
W 5	RED	——	——
W 6	BROWN	——	——
W 7	BLACK	——	——
W 8	——	1.00	BUSS
W 9	ORANGE	——	——
W 10	YELLOW	——	——
W 11	L. GREEN	——	——
W 12	BLUE	——	——
W 13	D. GREEN	——	——
W 14	YELLOW	1.50	22 AWG
W 15	YELLOW	——	——
W 16	RED	——	——
W 17	ORANGE	——	——
W 18	VIOLET	——	——
W 19	BROWN	——	——
W 20	BLACK	——	——
W 21	——	.75	BUSS
W 22	——	1.00	BUSS
W 23	——	.75	BUSS
W 24	——	.75	BUSS
W 25	——	.75	BUSS
W26	GREEN	2.00	22 AWG
W27	BLACK	3.00	22 AWG



NOTES:

1. WIRES 3-7, 9-13 AND 15-20 ARE PRECUT AND SUPPLIED UNDER ITEM NO. 2.
2. R38, R59, R106, R110 AND R113 ARE ON .40 SPACING

3 REFER TO INSTRUCTION MANUAL PARAGRAPH 3.8.1 FOR USE OF ALTERNATE CONNECTION.

153202F

Figure 8-34. Model 6350 Video Switch and AGC PW Board Assembly

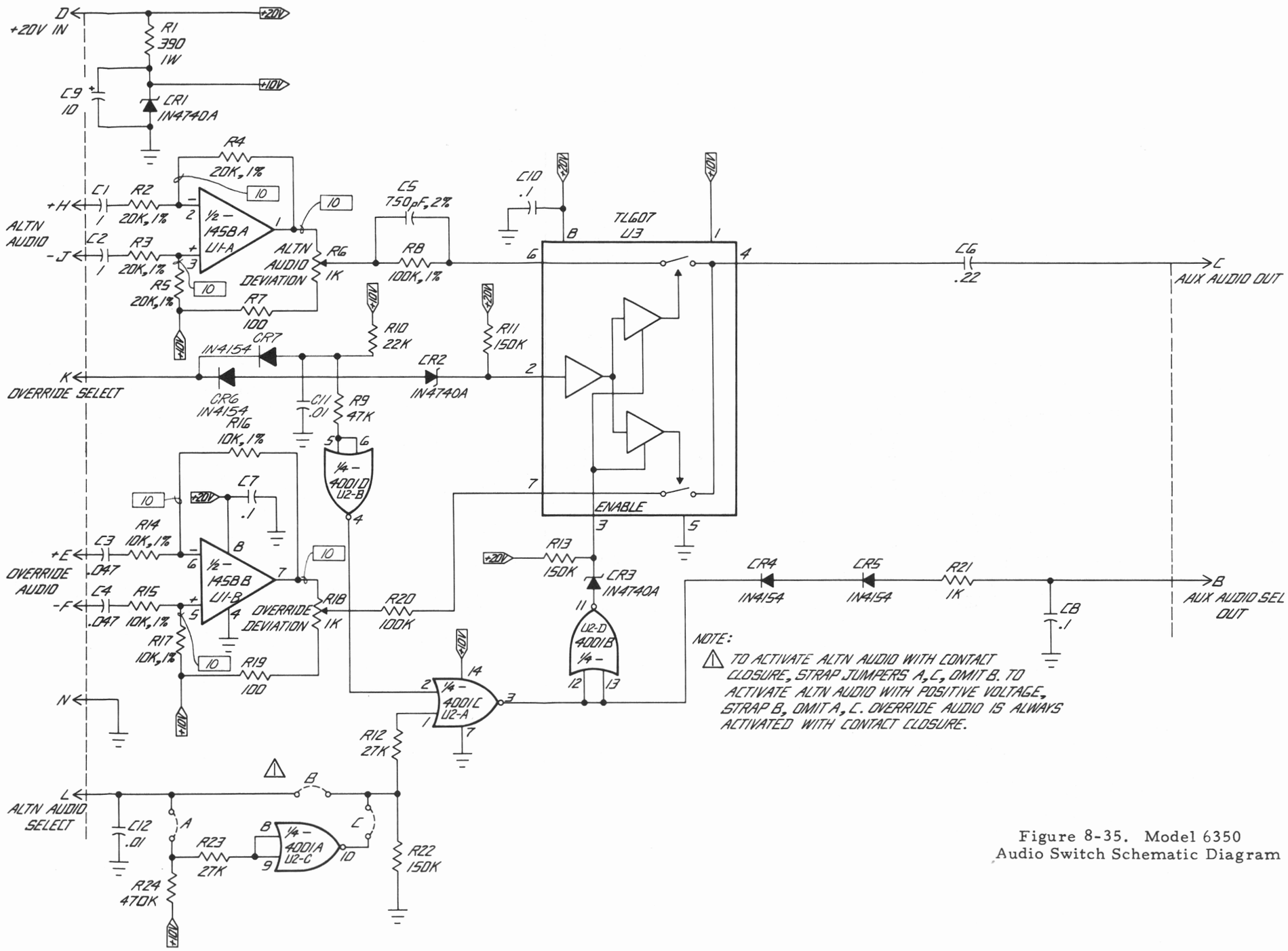
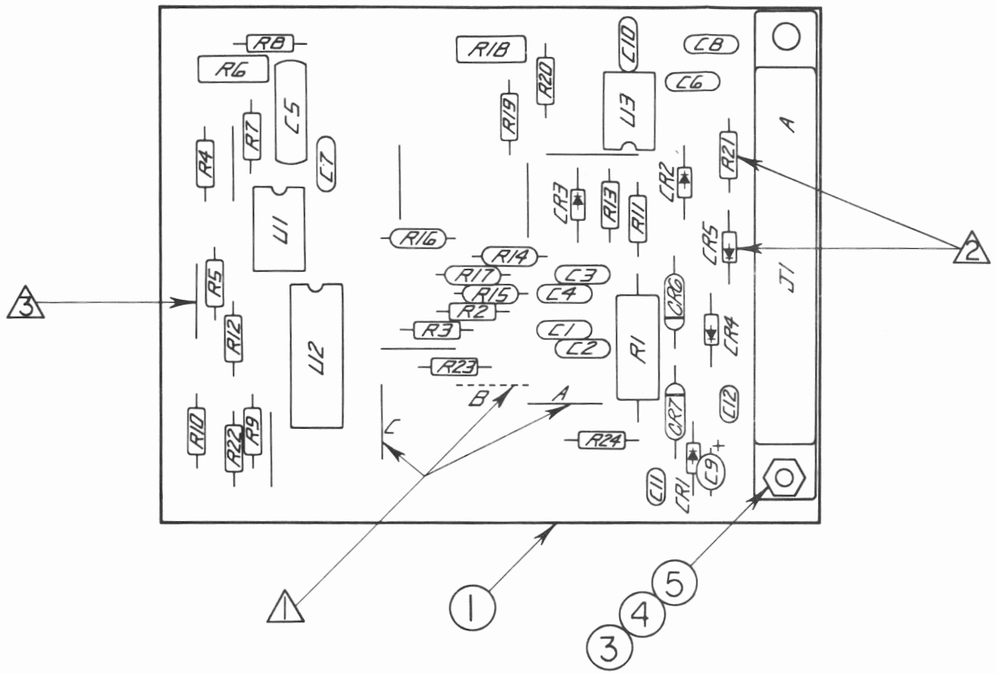


Figure 8-35. Model 6350
Audio Switch Schematic Diagram

162608B

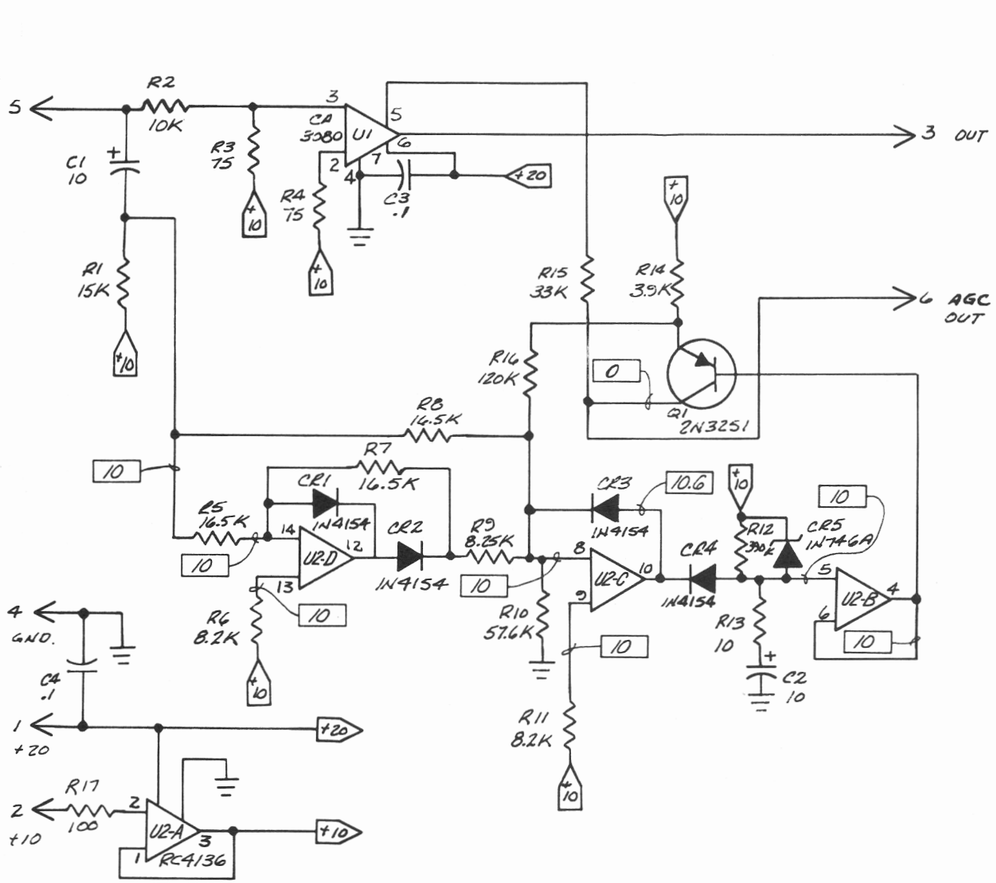


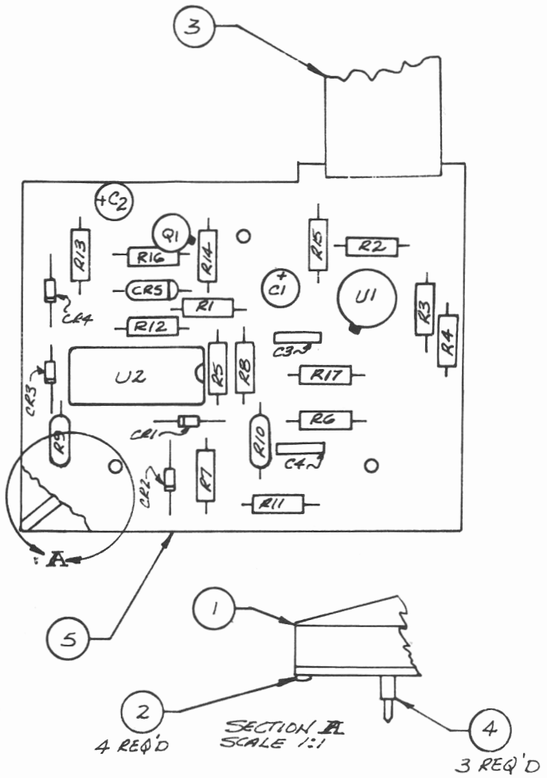
NOTES:

1. TO ACTIVATE ALTN AUDIO WITH CONTACT CLOSURE, STRAP JUMPERS A, C, OMIT B. TO ACTIVATE ALTN AUDIO WITH POSITIVE VOLTAGE, STRAP B, OMIT A, C. OVERRIDE AUDIO IS ALWAYS ACTIVATED WITH CONTACT CLOSURE.
2. ALL ¼ WATT RESISTORS AND DIODES ARE ON .40 SPACING.
3. JUMPERS ARE NO. 22GA BUSS WIRE.
4. OMIT JUMPER B IN ASSEMBLY.

162606A

Figure 8-36. Model 6350 Audio Switch PW Board Assembly



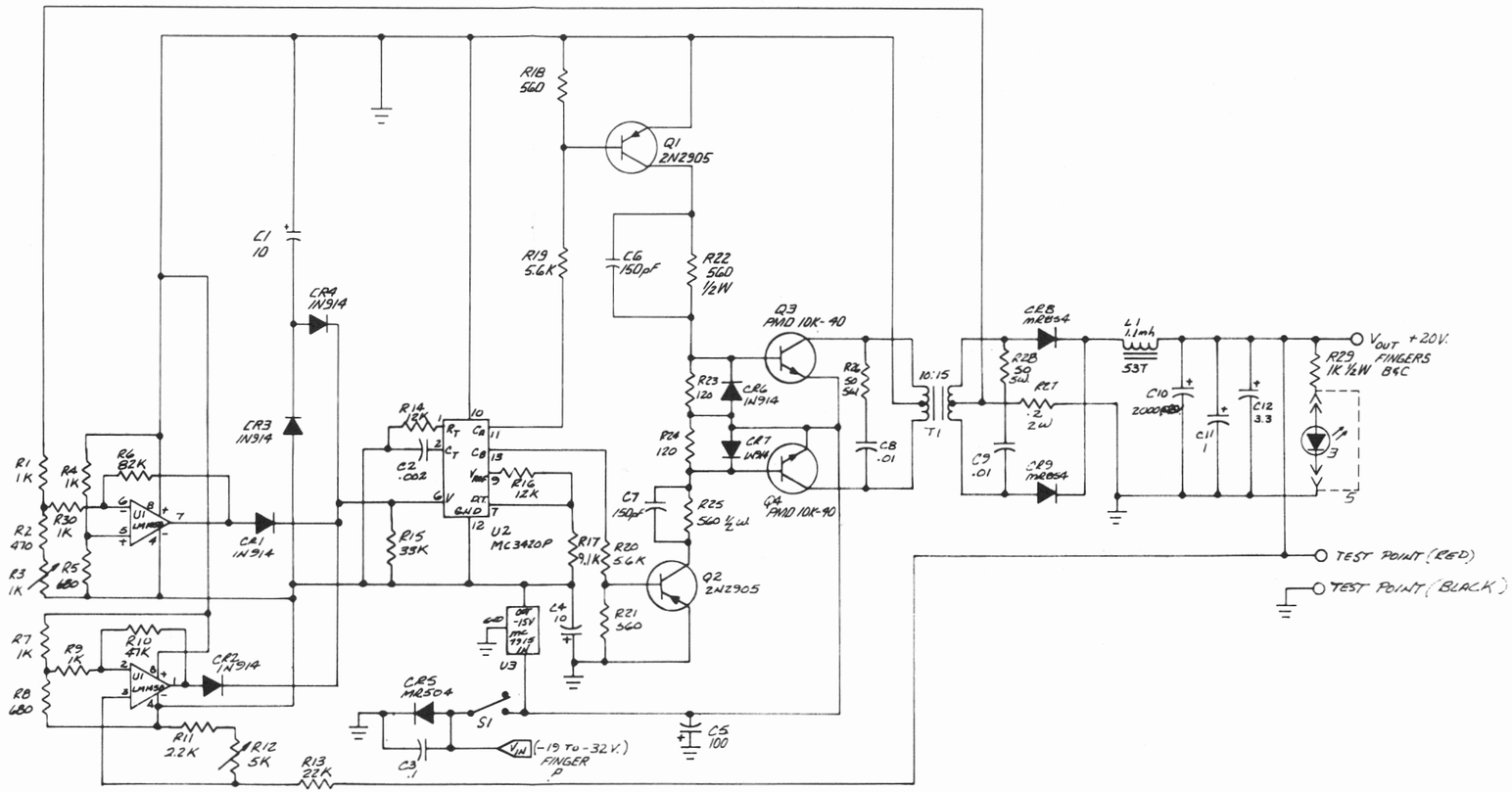


NOTE:

1. VOLTAGE MEASUREMENTS WERE MADE WITH NO VOLTAGE APPLIED, AND MAY VARY ±20%.

153189A

Figure 8-37. Model 6350
Audio Modulation Limiter
Assembly and Schematic Diagram

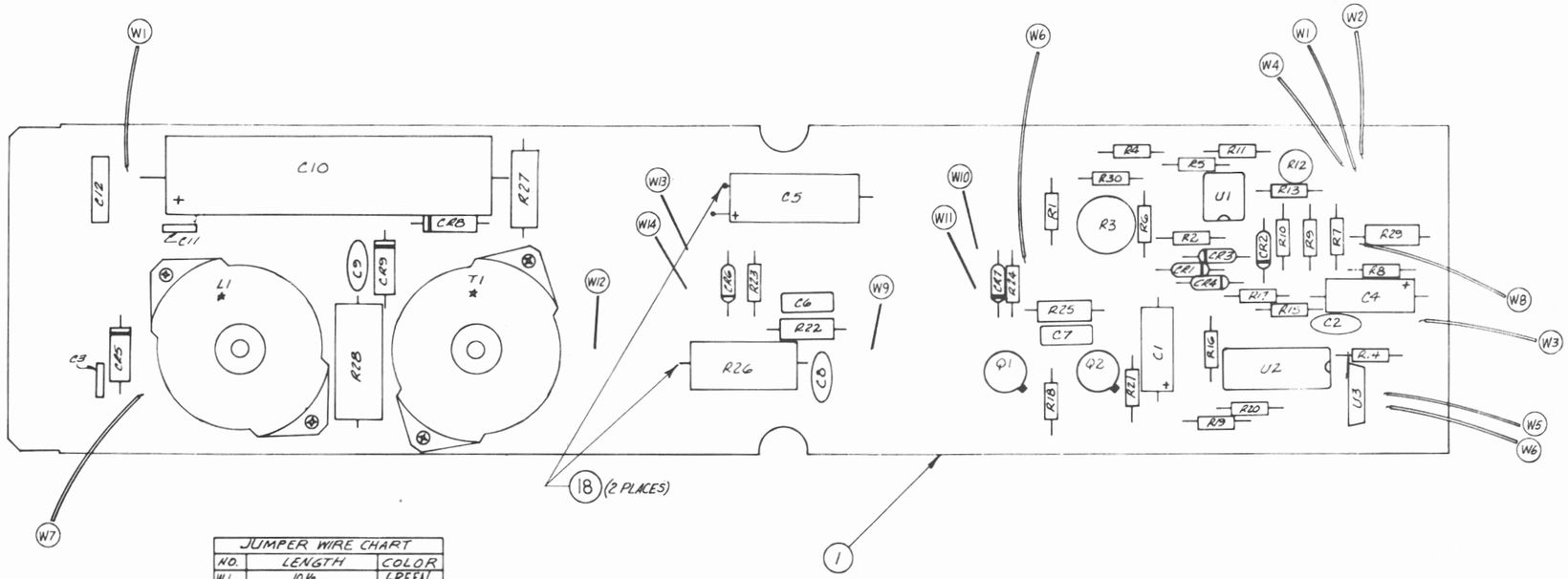


NOTE:

1. U2: 5→8
   4→16
   15: GND

156983B

Figure 8-38. Model 6350
DC Converter Schematic Diagram



18 (2 PLACES)

1

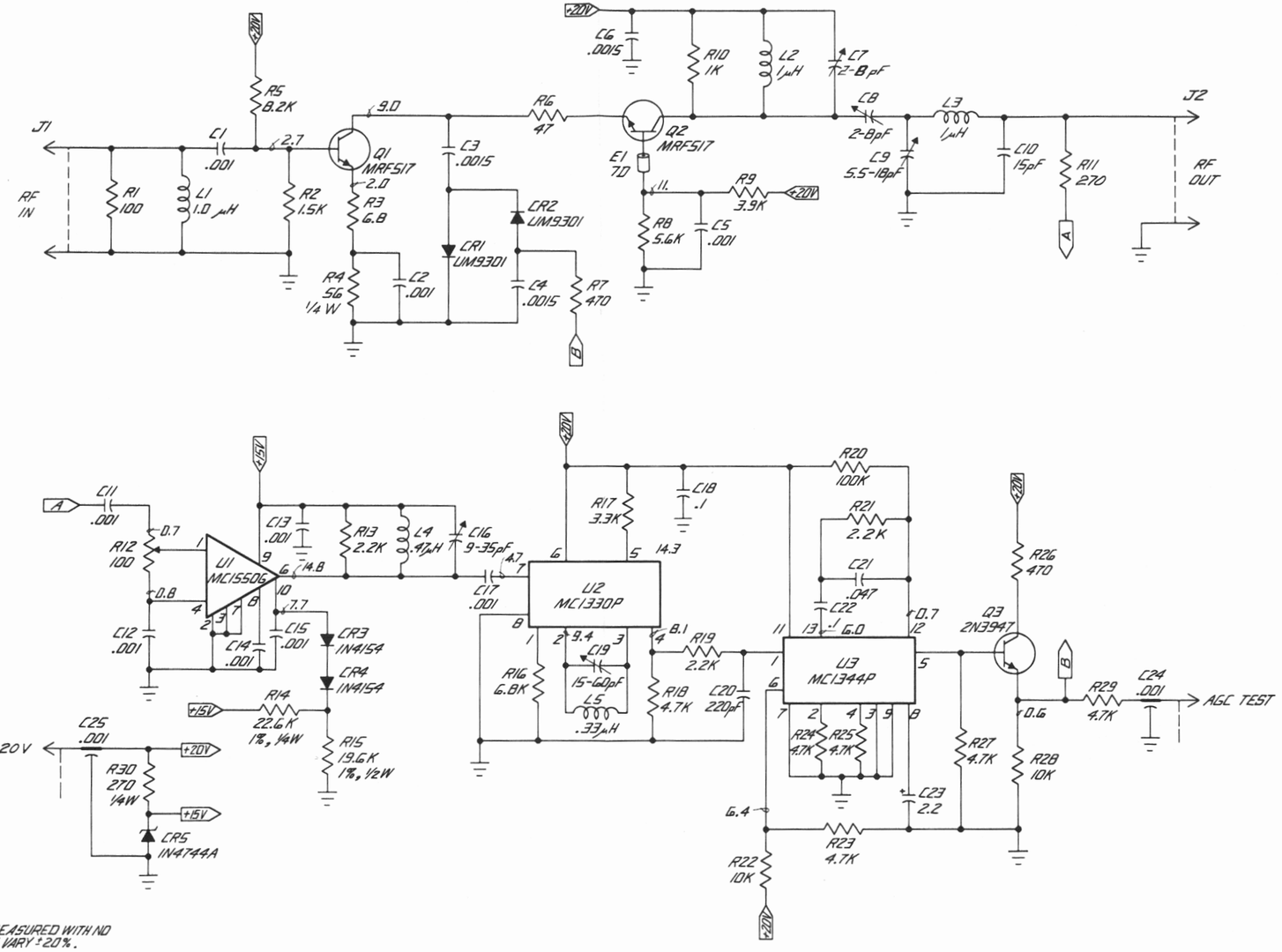
★ ADDED ON NEXT ASSEMBLY

JUMPER WIRE CHART		
NO.	LENGTH	COLOR
W1	10½	GREEN
W2	2	RED
W3	1½	BLACK
W4	1½	YELLOW
W5	1½	WHT
W6	5	BLUE
W7	12	WHT
W8	1½	BLACK
W9	1½	BLACK
W10	1½	RED
W11	1½	WHITE
W12	1½	BLACK
W13	1½	RED
W14	1½	WHITE

SEE SEPARATE PARTS LIST

Figure 8-39. Model 6350
DC Converter PW Board Assembly

156982D

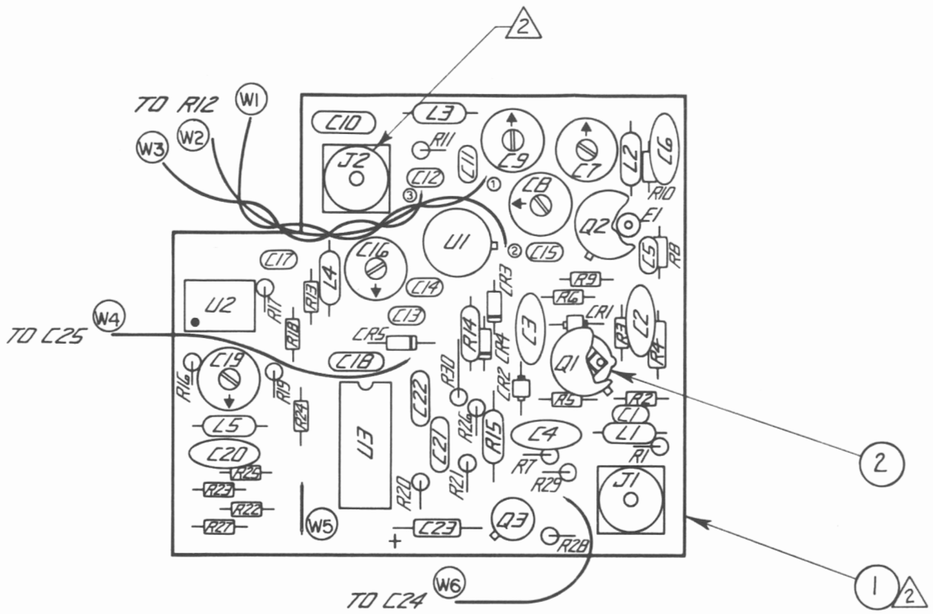


NOTE:
VOLTAGES ARE MEASURED WITH NO INPUT, AND MAY VARY ±20%.

Figure 8-40. Model 6350
Auxiliary IF AGC Schematic Diagram

162613D

25R243D



WIRE CHART			
NO.	COLOR	LENGTH	TYPE
W1	ORANGE	3.0	22 AWG
W2	BLUE	3.0	22 AWG
W3	GRAY	3.0	22 AWG
W4	RED	2.0	22 AWG
W5		.80	INSUL BUSS
W6	GREEN	3.0	22 AWG

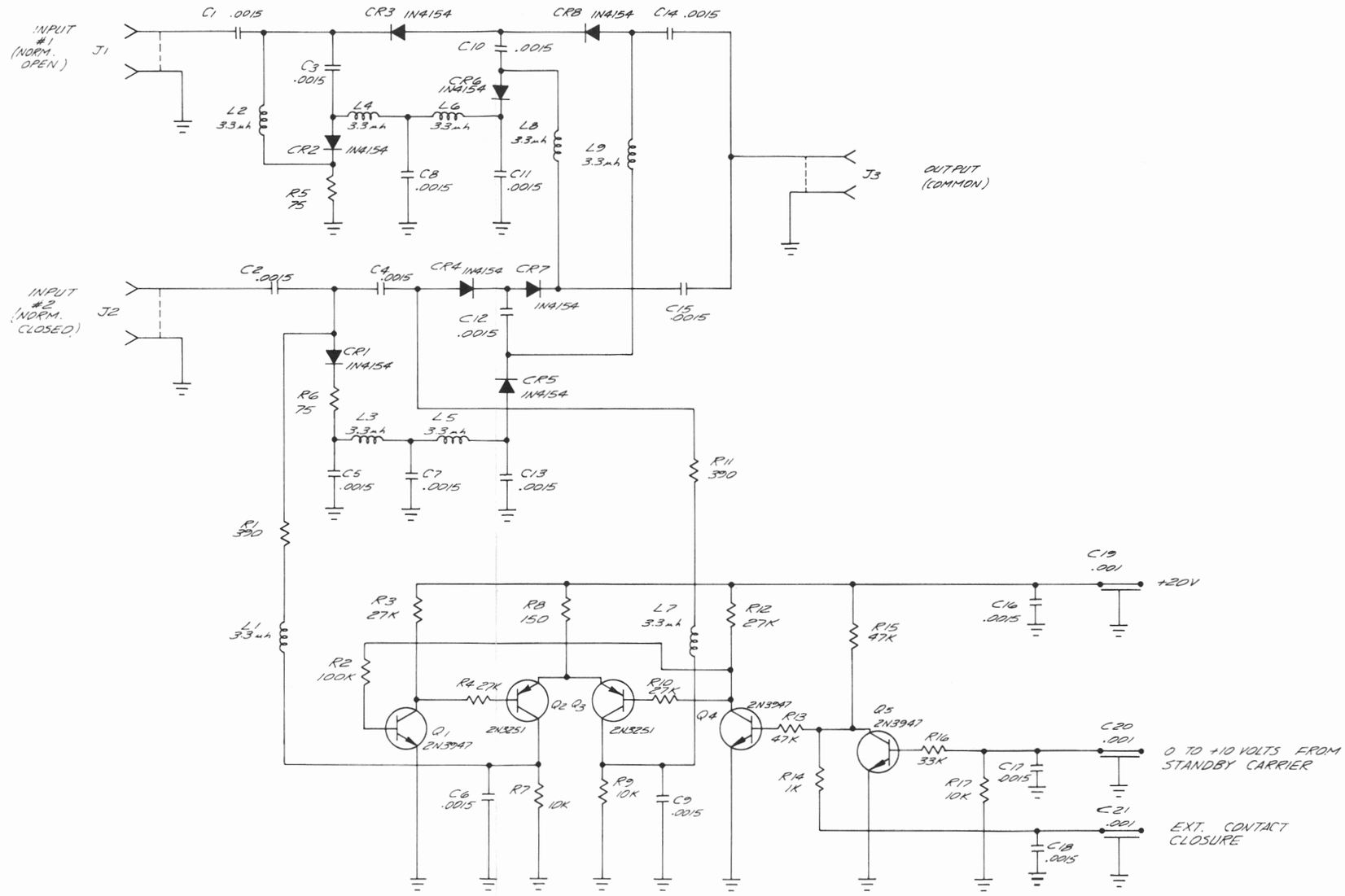
NOTES:

1. ALL RESISTORS EXCEPT R4, R14, R30, AND R15 ARE 1/8 WATT.

2. J1 AND J2 MUST BE MOUNTED FLUSH TO THE PW BOARD. CONNECTORS CANNOT BE TILTED.

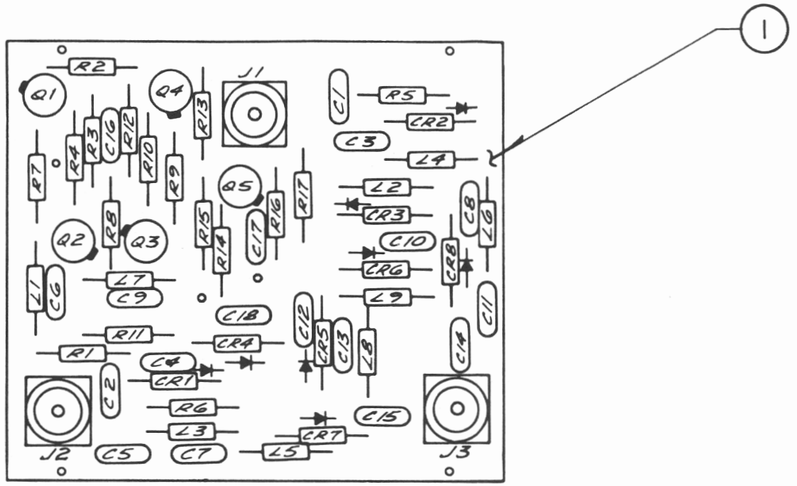
162612A

Figure 8-41. Model 6350
Auxiliary IF AGC PW Board Assembly



36598

Figure 8-42. Model 6350
Solid State Switch Schematic Diagram



1

36597

1- INSTALL ALL TRANSISTORS WITH A CLEARANCE OF .12-.16 INCHES BETWEEN PC BOARD AND BOTTOM OF TRANSISTOR CASE

NOTES:

Figure 8-43. Model 6350 Solid State PW Board Assembly

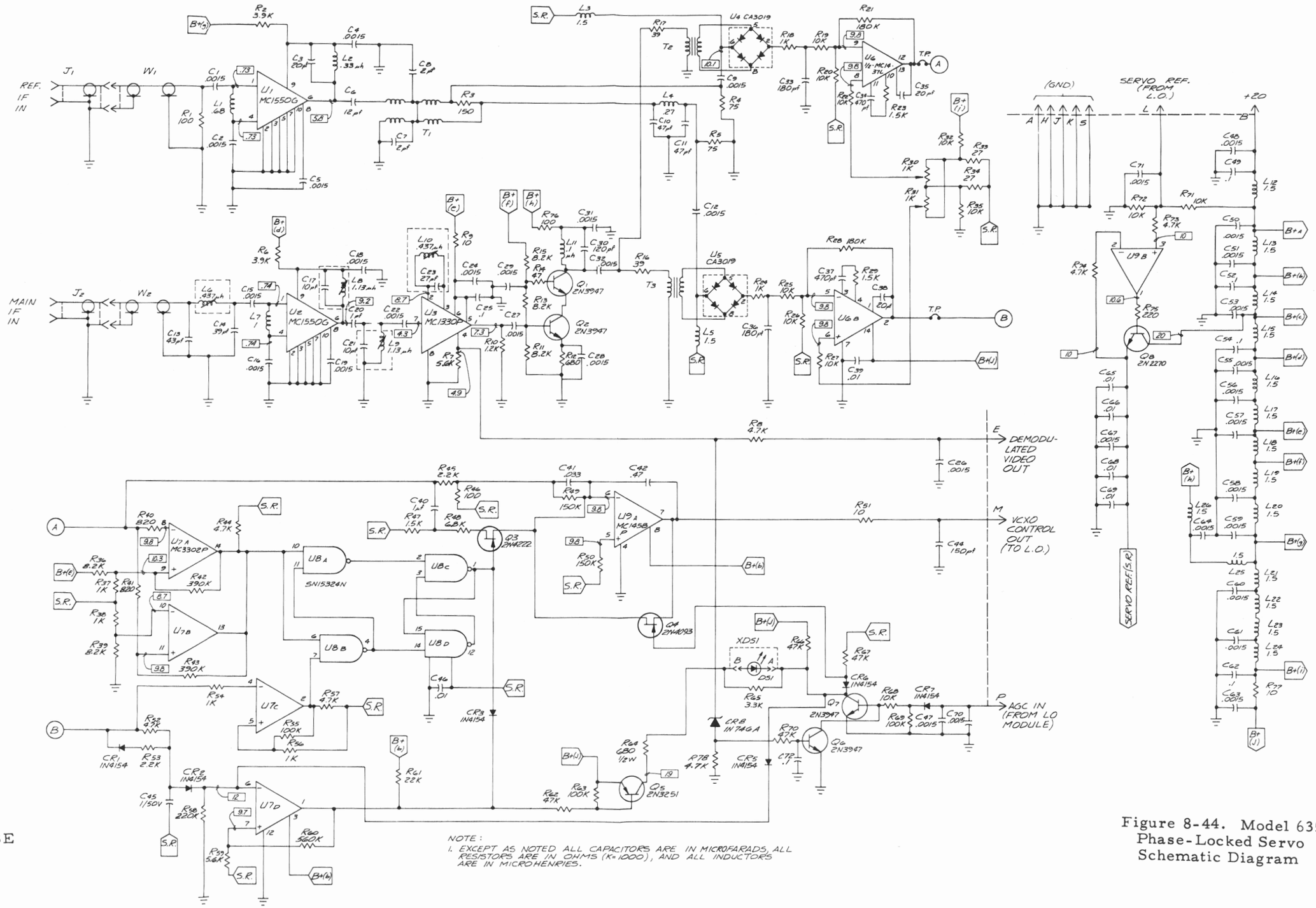
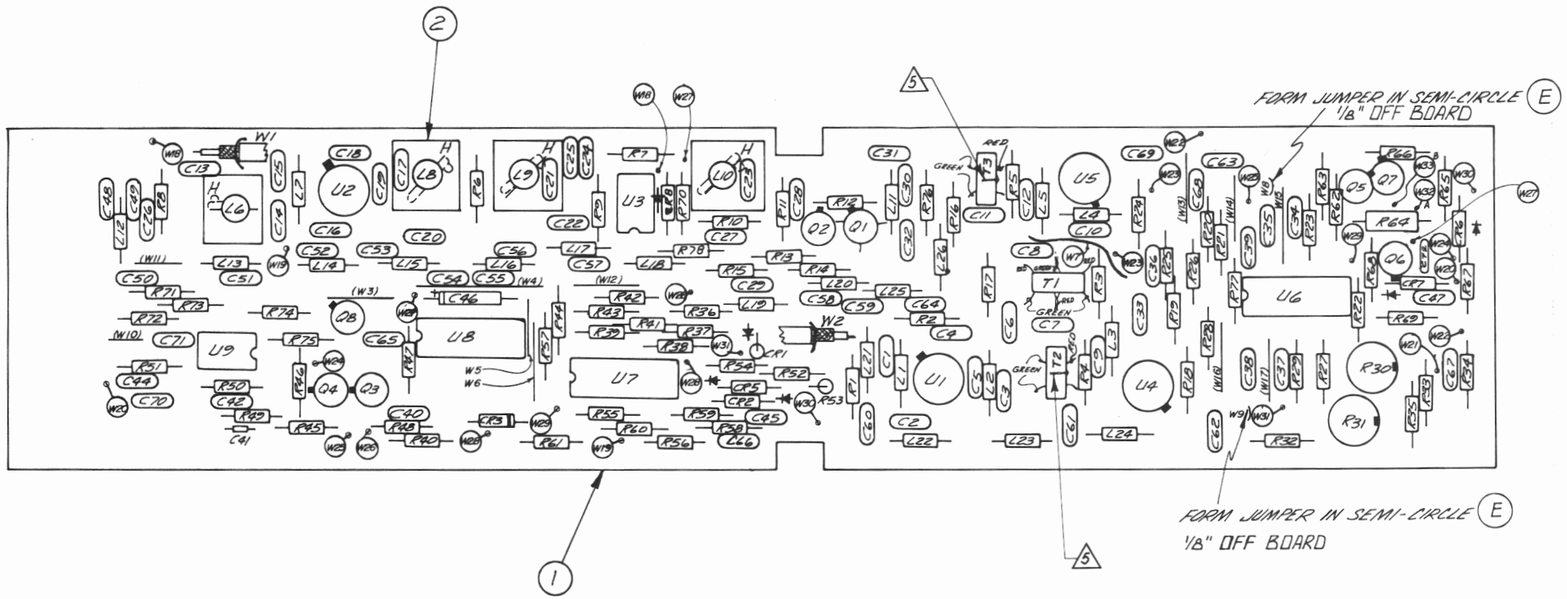


Figure 8-44. Model 6350 Phase-Locked Servo Schematic Diagram



NOTE:

1. U8 IS INTERCHANGABLE WITH MC 3302 P OR LM339.

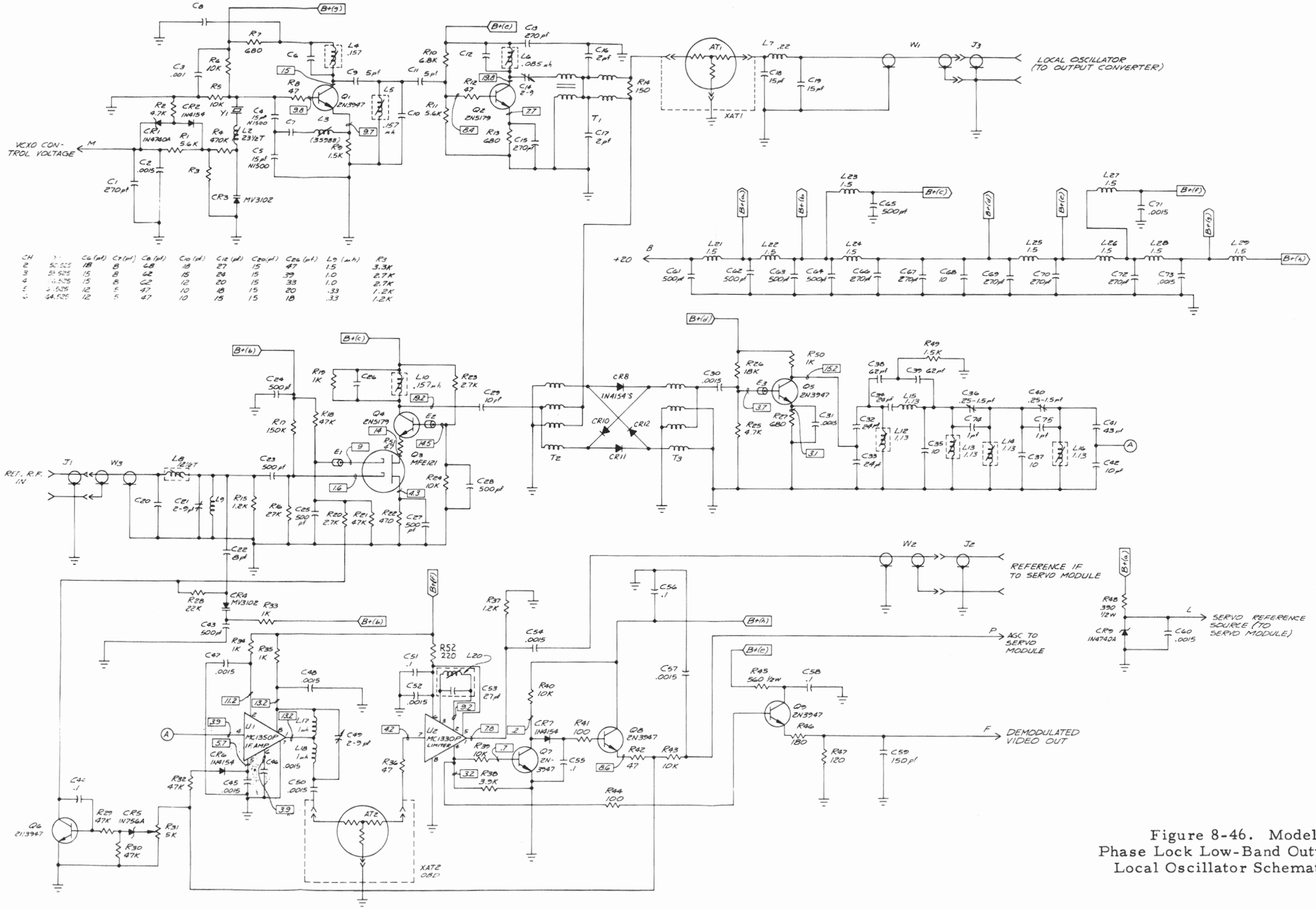
5 CLIP TWISTED WIRES AS CLOSE TO CORE AS POSSIBLE; (.125 MIN REQUIRED FOR TINNING).

36177J

JUMPER WIRE CHART

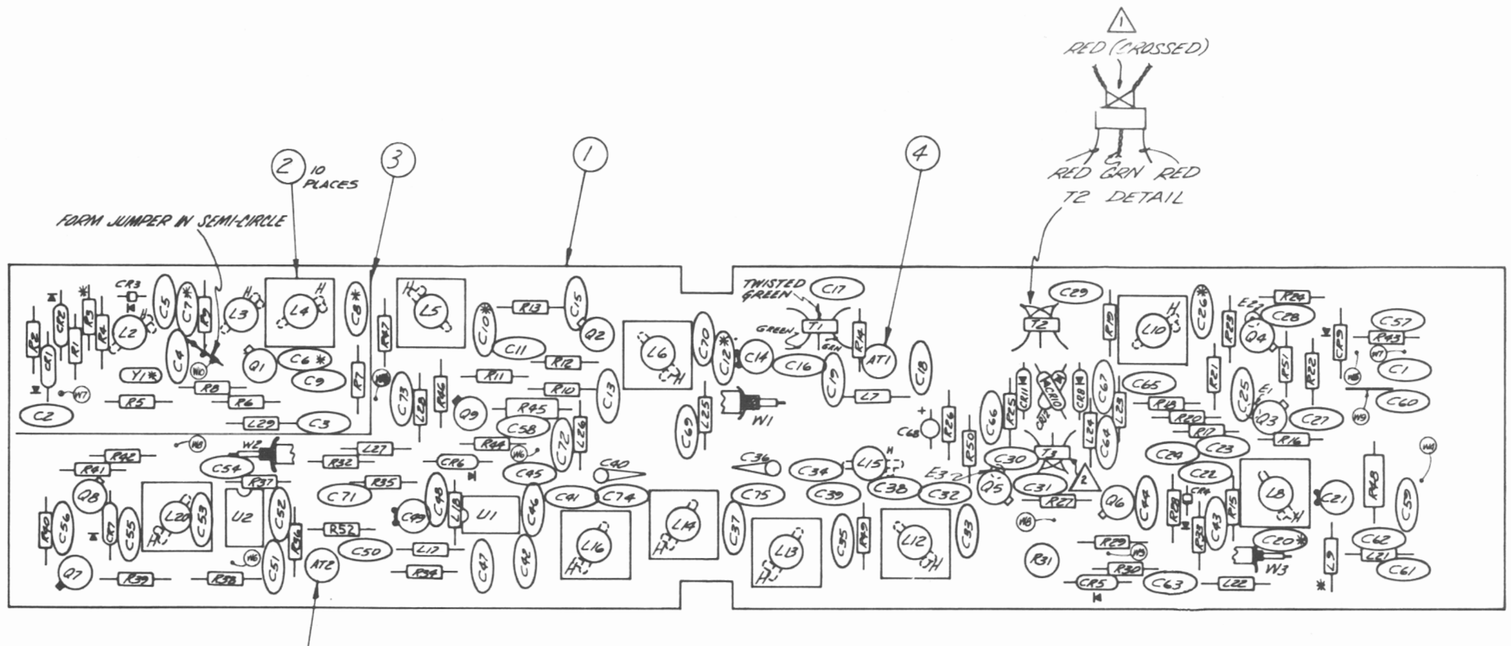
REF DES.	PART NUMBER	GA.	TYPE	COLOR	LENGTH IN INCHES
W1	C230922	22	CABLE		4½
W2	C230924	22	CABLE		6
W3	C073442	22	SOLID	WHITE	1
W4	C073442	22	SOLID	WHITE	1½
W5	C073442	22	SOLID	WHITE	1
W6	C073442	22	SOLID	WHITE	1
W7	C073442	22	SOLID	WHITE	1½
W8	C073318	22	BUSS		1
W9					1
W10					1
W11					1
W12					1
W13					1
W14					1
W15					1
W16					1
W17					1
W18	C073435	22	SOLID	RED	4½
W19	C073436	22	SOLID	ORANGE	4½
W20	C073439	22	SOLID	BLUE	13
W21	C073438	22	SOLID	GREEN	10
W22	C073438	22	SOLID	GREEN	4¼
W23	C073438	22	SOLID	GREEN	1½
W24	C073442	22	SOLID	WHITE	11½
W25	C073441	22	SOLID	GRAY	11¾
W26	C073441	22	SOLID	GRAY	4
W27	C073437	22	SOLID	YELLOW	9¾
W28	C073434	22	SOLID	BROWN	3¼
W29	C073443	22	SOLID	PINK	10
W30	C073440	22	SOLID	VIOLET	7¾
W31	C073433	22	SOLID	BLACK	5¾
W32	C073442	22	STRANDED	WHITE	1¾
W33	C073442	22	STRANDED	BLACK	1¾

Figure 8-45. Model 6350 Phase-Locked Servo PW Board Assembly



CH		C_6 (pf)	C_7 (pf)	C_8 (pf)	C_{10} (pf)	C_{12} (pf)	C_{20} (pf)	C_{26} (pf)	L_9 (μh)	R3
2	50.525	18	8	68	18	27	15	47	1.5	3.3K
3	52.525	15	8	62	15	24	15	39	1.0	2.7K
4	54.525	15	8	62	12	20	15	33	1.0	2.7K
5	62.525	12	5	47	10	18	15	20	.33	1.2K
6	64.525	12	5	47	10	15	15	18	.33	1.2K

Figure 8-46. Model 6350
Phase Lock Low-Band Output Converter
Local Oscillator Schematic Diagram



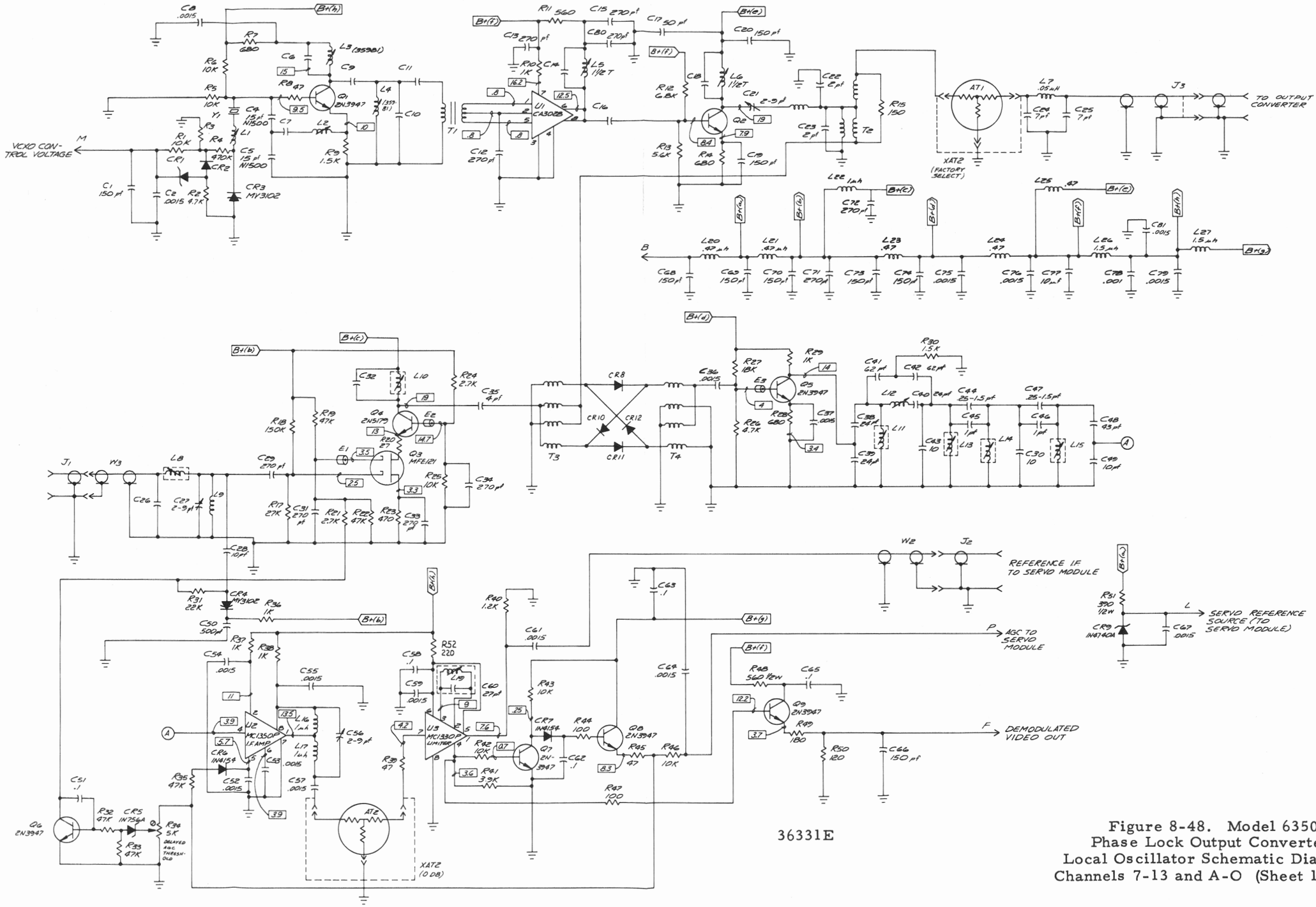
JUMPER WIRE CHART		
NUMBER	COLOR	LENGTH
W4	VIOLET (22 GA)	11"
W5	VIOLET	5"
W6	YELLOW	3"
W7	GREEN	11⅛"
W8	GRAY	10"
W9	WHITE	1⅛"
W10	BUS	1¼"

NOTES:

1. SEE DETAIL FOR T2
2. SEE DETAIL FOR T3
* CHANNEL SENSITIVE

231502-231506E

Figure 8-47. Model 6350 Phase Lock Low-Band Output Converter Local Oscillator PW Board Assembly



36331E

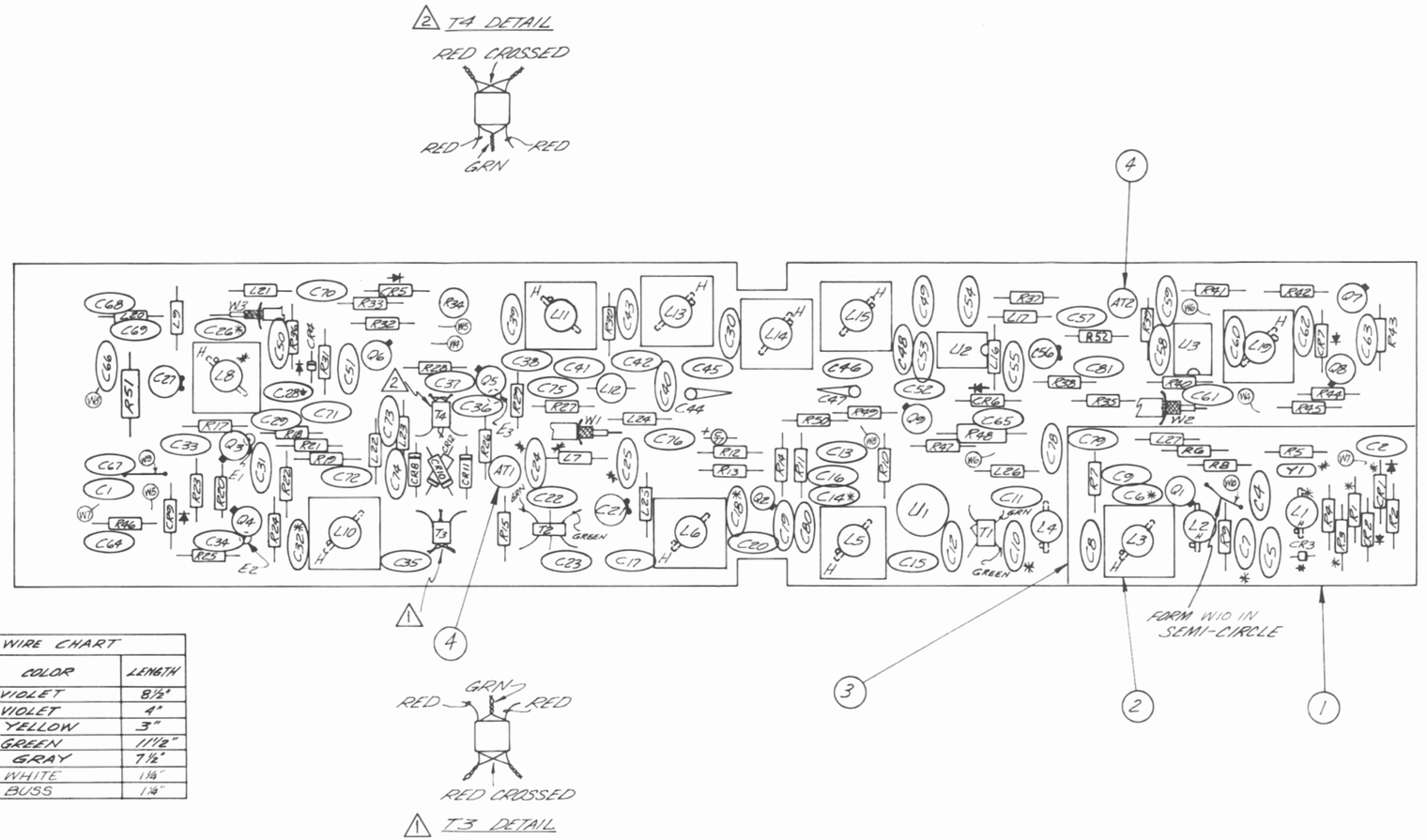
Figure 8-48. Model 6350
Phase Lock Output Converter
Local Oscillator Schematic Diagram
Channels 7-13 and A-O (Sheet 1 of 2)

COMPONENTS CHART

CHANNEL	Y1 (MHz)	C6 (pf)	C7 (pf)	C9 (pf)	C10 (pf)	C11 (pf)	C14 (pf)	C16 (pf)	C18 (pf)	C26 (pf)	C32 (pf)	CR1	L1	L8	L% (H)	L10	R3
7	55.2625	20	8	2.2	20	5	7	2.2	8	12	4.0	IN752A	21½ T	4½ T	.05	2½ T	10 K
8	56.7625	20	8	2.2	20	5	5	2.2	7	12	1.5	IN752A	21½ T	4½ T	.05	2½ T	10 K
9	58.2625	20	5	2.2	20	5	5	2.2	7	15	1.5	IN752A	21½ T	3½ T	.05	2½ T	10 K
10	59.7625	18	5	2.2	20	5	4	2.2	7	15	.5	IN752A	21½ T	3½ T	.05	2½ T	33 K
11	61.2625	18	5	2.2	20	5	4	2.2	5	15	.5	IN4736	21½ T	3½ T	.05	2½ T	6.8 K
12	62.7625	15	5	2.2	12	5	3	2.2	5	15	.5	IN4736	19½ T	3½ T	.05	2½ T	6.8 K
13	64.2625	15	5	2.2	12	5	3	2.2	5	15	.5	IN752A	19½ T	3½ T	.05	2½ T	15 K
A	55.69	7	8	2.2	2.2	5	15	2.2	18		15	IN752A	21½ T	6½ T	0.1	2½ T	10 K
B	57.69	7	8	2.2	2.2	5	15	2.2	15		12	IN752A	21½ T	6½ T	0.1	2½ T	10 K
C	59.69	5	5	2.2	1.5	5	15	2.2	15		10	IN752A	21½ T	6½ T	0.1	2½ T	10 K
D	61.69	4	5	2.2		5	12	2.2	15		8	IN752A	21½ T	5½ T	.05	2½ T	10 K
E	63.69	3	5	2.2		5	12	2.2	12		8	IN752A	21½ T	5½ T	.05	2½ T	10 K
F	49.2625	27	10	2.2	27	5	10	2.2	10		5	IN752A	23½ T	5½ T	.05	2½ T	10 K
G	50.7625	27	10	2.2	22	5	8	2.2	10		5	IN752A	23½ T	4½ T	.05	2½ T	10 K
H	52.2625	24	8	2.2	22	5	8	2.2	10		4	IN752A	23½ T	4½ T	.05	2½ T	10 K
I	53.7625	22	8	2.2	22	5	7	2.2	8		4	IN752A	21½ T	4½ T	.05	2½ T	10 K
J	65.7625	15	5	2.2	10	5	3	2.2	5		5	IN4737A	19½ T	3½ T	.05	2½ T	5.6 K
K	67.2625	12	5	2.2	10	5	2.2	2.2	4			IN752A	19½ T	3½ T	.05	2½ T	10 K
L	68.7625	12	4	2.2	10	5	1.0	2.2	4		4.0	IN4737A	19½ T	2.5T	.05	2½ T	5.6 K
M	70.2625	12	4	2.2	10	5	1.0	2.2	3		4.0	IN752A	19½ T	2.5T	.05	1½ T	10 K
N	71.7625	12	4	1.0	10	4		4.0	3		3.0	IN752A	17½ T	2.5T	.05	1½ T	10 K
O	73.2625	12	4	1.0	8	4		4.0	2		2.2	IN752A	19½ T	2.5T	.05	1½ T	15 K

36331E

Figure 8-48. Model 6350 Phase Lock Output Converter Local Oscillator Schematic Diagram, Channels 7-13 and A-O (Sheet 2 of 2)



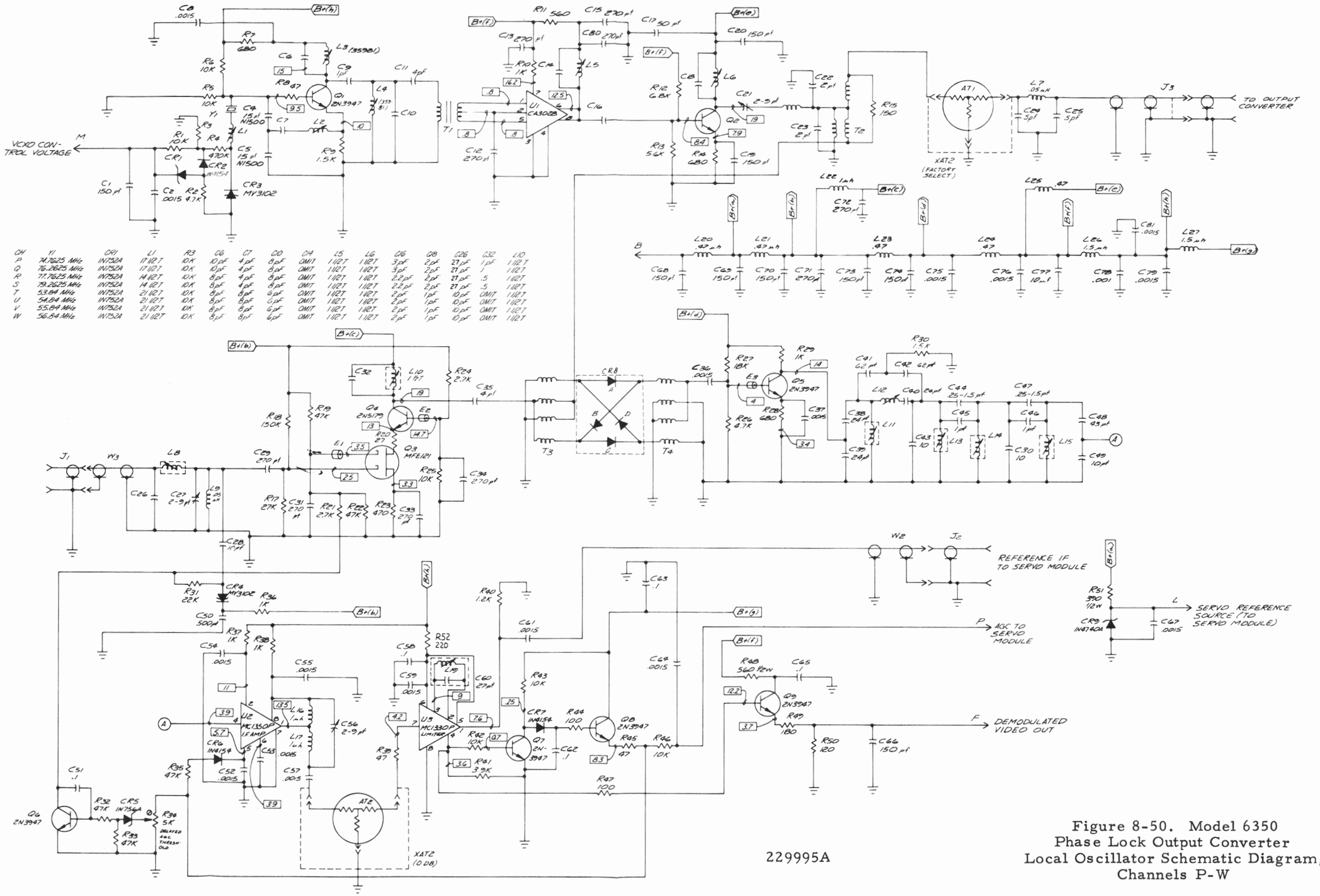
JUMPER WIRE CHART		
NUMBER	COLOR	LENGTH
W4	VIOLET	8½"
W5	VIOLET	4"
W6	YELLOW	3"
W7	GREEN	11½"
W8	GRAY	7½"
W9	WHITE	1½"
W10	BUSS	1½"

NOTES:

1. SEE DETAIL FOR T3
2. SEE DETAIL FOR T4
3. * CHANNEL OR BAND SENSITIVE
4. ALL JUMPER WIRES ARE ROUTED DOWN CENTER OF MODULE AND ARE TIED TOGETHER, EXCEPT GREEN WIRE, WHICH IS ROUTED ALONG SIDE OF MODULE

231507-231528K

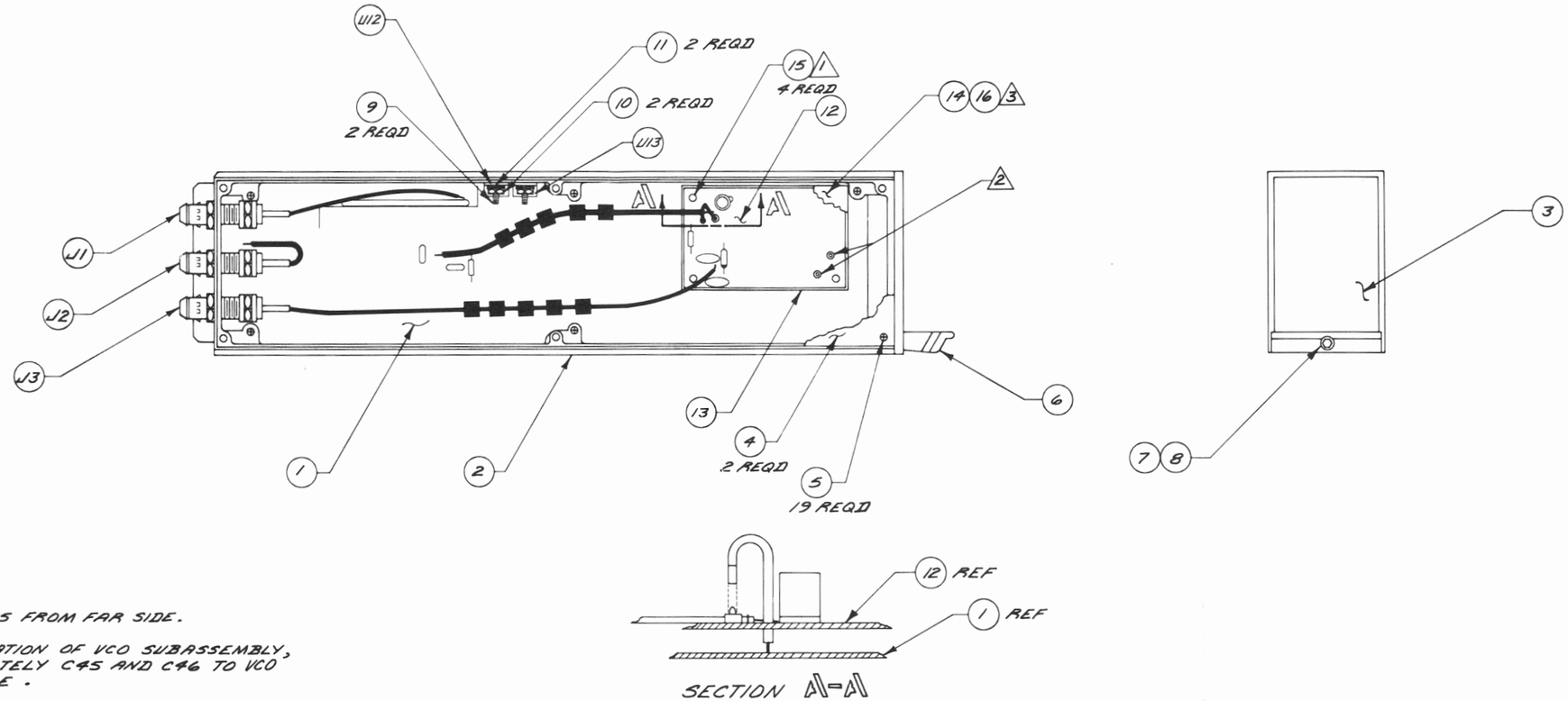
Figure 8-49. Model 6350
Phase Lock Output Converter
Local Oscillator PW Board Assembly,
Channels 7-13 and A-O



CH	Y1	CR1	L1	R3	C6	C7	C10	C14	L5	L6	C16	C8	C26	C32	L10
P	74.7625 MHz	IN752A	17 1/2T	10K	10 pf	4 pf	8 pf	OMIT	1 1/2T	1 1/2T	3 pf	2 pf	27 pf	1 pf	1 1/2T
Q	76.2625 MHz	IN752A	17 1/2T	10K	10 pf	4 pf	8 pf	OMIT	1 1/2T	1 1/2T	3 pf	2 pf	27 pf	1	1 1/2T
R	77.7625 MHz	IN752A	14 1/2T	10K	8 pf	4 pf	8 pf	OMIT	1 1/2T	1 1/2T	2.2 pf	2 pf	27 pf	.5	1 1/2T
S	79.2625 MHz	IN752A	14 1/2T	10K	8 pf	4 pf	8 pf	OMIT	1 1/2T	1 1/2T	2.2 pf	2 pf	27 pf	.5	1 1/2T
T	53.84 MHz	IN752A	21 1/2T	10K	8 pf	6 pf	6 pf	OMIT	1 1/2T	1 1/2T	2 pf	1 pf	10 pf	OMIT	1 1/2T
U	54.84 MHz	IN752A	21 1/2T	10K	8 pf	8 pf	6 pf	OMIT	1 1/2T	1 1/2T	2 pf	1 pf	10 pf	OMIT	1 1/2T
V	55.84 MHz	IN752A	21 1/2T	10K	8 pf	8 pf	6 pf	OMIT	1 1/2T	1 1/2T	2 pf	1 pf	10 pf	OMIT	1 1/2T
W	56.84 MHz	IN752A	21 1/2T	10K	8 pf	8 pf	6 pf	OMIT	1 1/2T	1 1/2T	2 pf	1 pf	10 pf	OMIT	1 1/2T

229995A

Figure 8-50. Model 6350 Phase Lock Output Converter Local Oscillator Schematic Diagram, Channels P-W

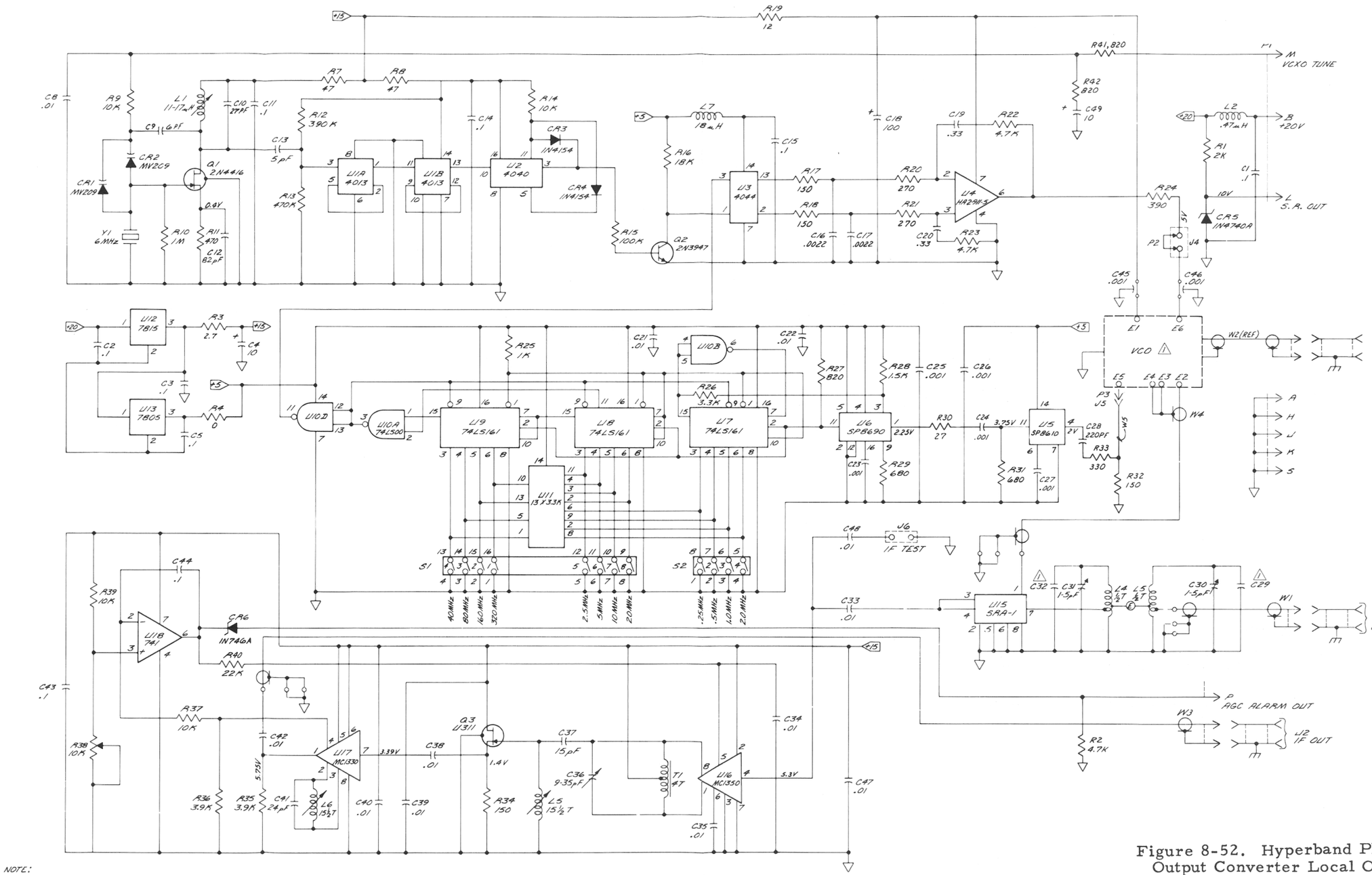


NOTES:

1. INSTALL ITEM 15 FROM FAR SIDE.
2. AFTER INSTALLATION OF VCO SUBASSEMBLY, SOLDER COMPLETELY C45 AND C46 TO VCO BOARD SURFACE.
3. ATTACH ITEM 16 ACROSS THE TOP CENTER OF ITEM 14.

233640-233657A

Figure 8-51. Hyperband Phase Lock Output Converter Local Oscillator Module Assembly



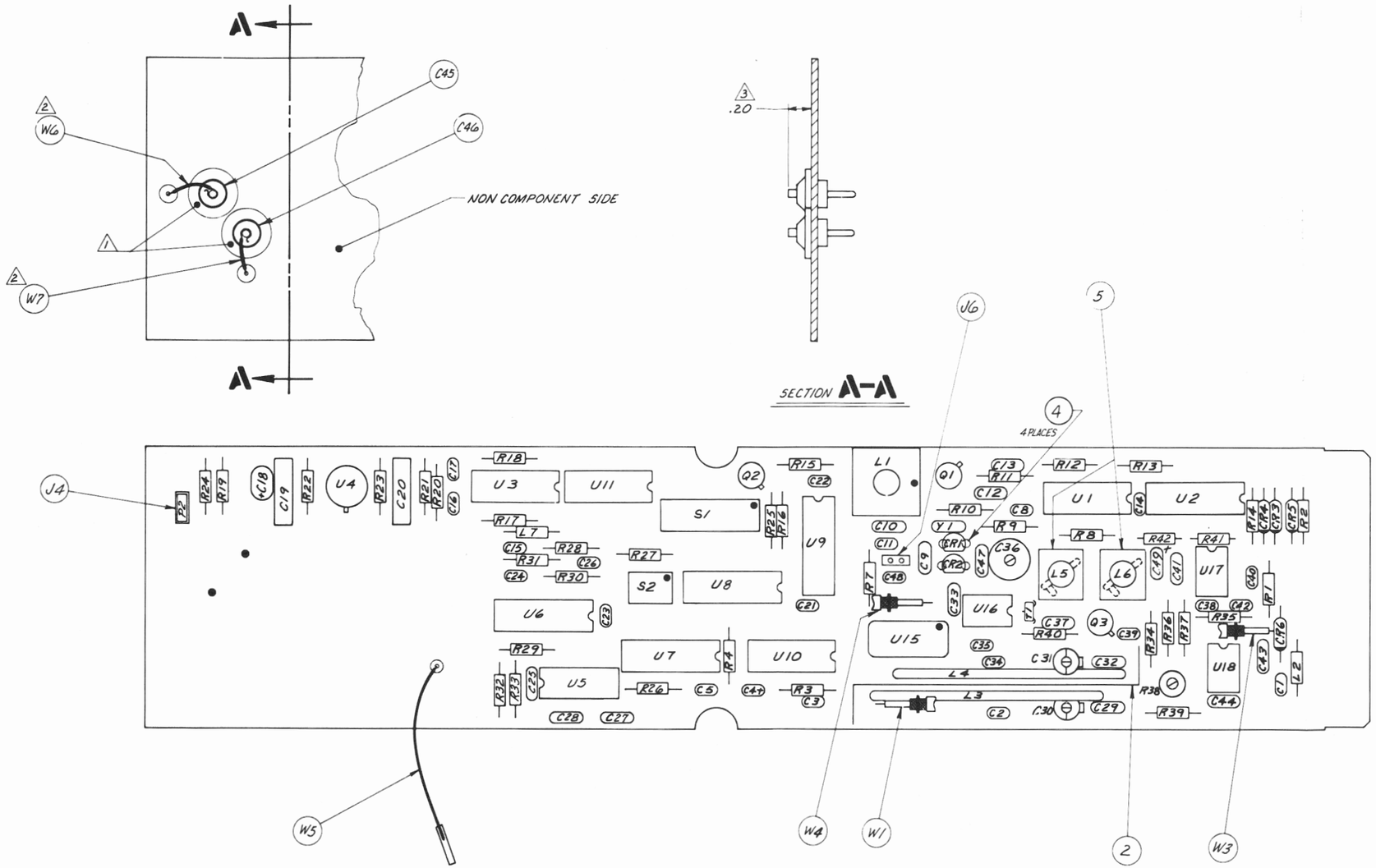
NOTE:

⚠

	C29	C32	VCO ASSY
LOW BAND	3pF	3pF	233822
MID BAND	NOT ASG'N	NOT ASG'N	233823
HIGH BAND	NOT ASG'N	NOT ASG'N	233824

231963B

Figure 8-52. Hyperband Phase Lock Output Converter Local Oscillator Schematic Diagram



NOTE:

1. SOLDER TO BE ALL AROUND EXISTING PAD FOR PROPER CONNECTION.
2. SEE CHART FOR LENGTH OF W6, W7 & ITEM 3.
3. C45 & C46 TO BE TRIMMED ON NON COMPONENT SIDE.

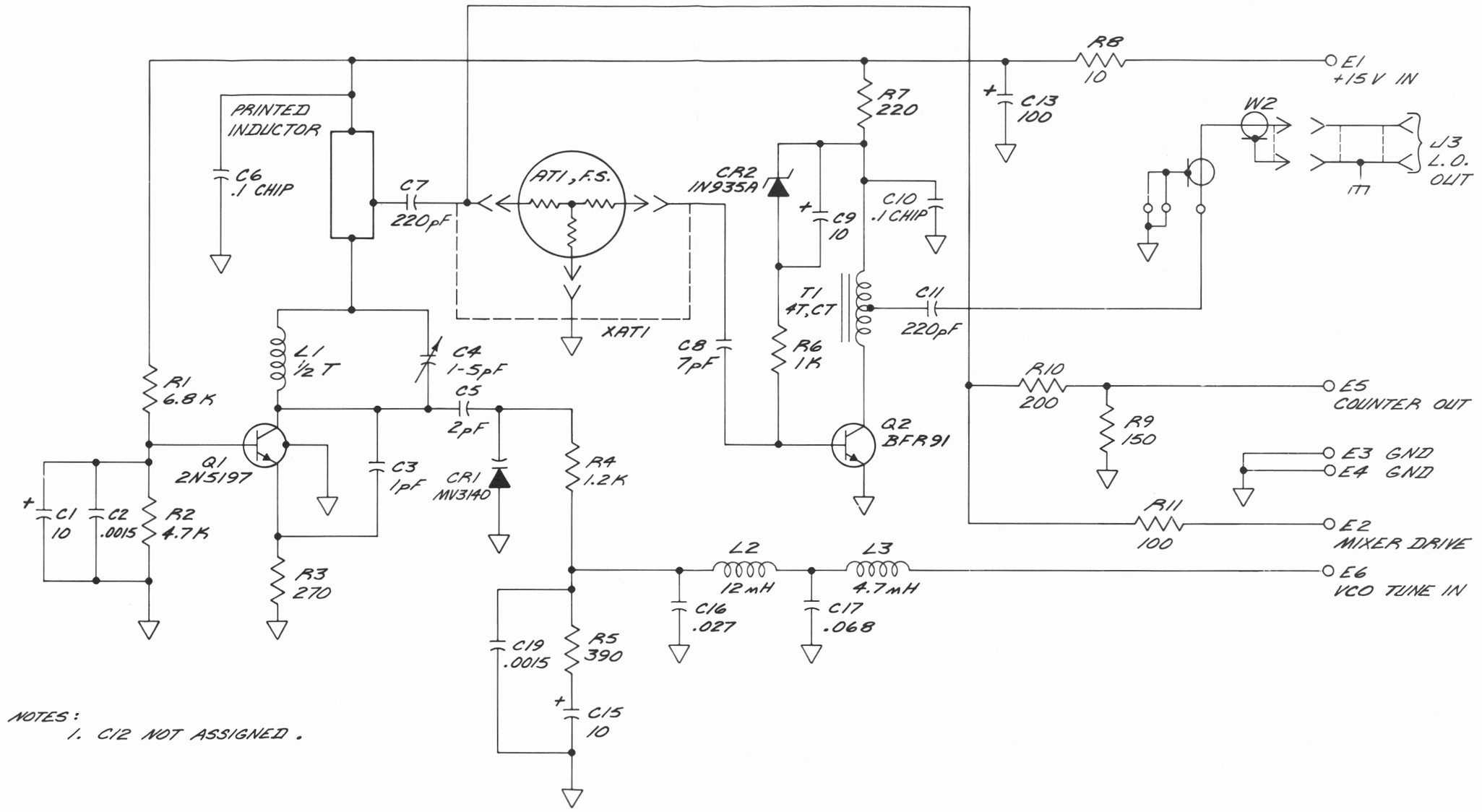
2

	WIRE LENGTH	SLEEVE LENGTH
W6	.80 IN.	.30 IN.
W7	.80 IN	.30 IN

SEE SEPARATE PARTS LIST

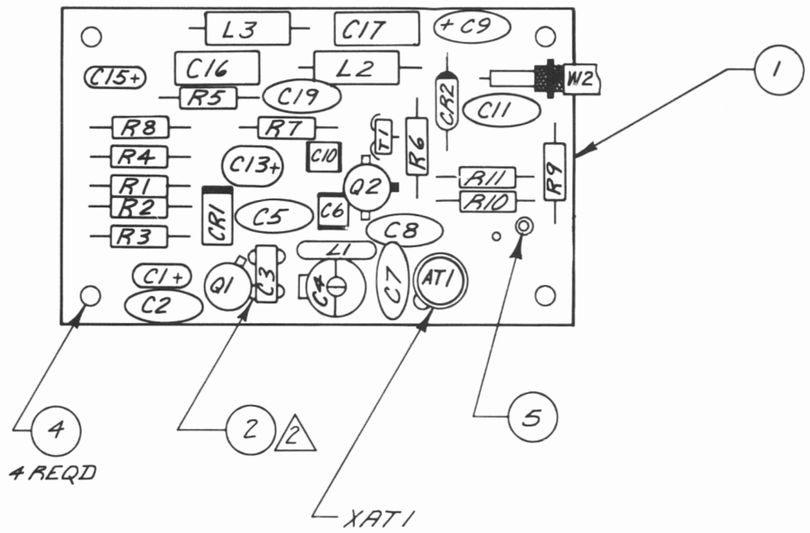
Figure 8-53. Hyperband Phase Lock Output Converter Local Oscillator PWB Assembly

233820-233821B



231966A

Figure 8-54. Hyperband Phase Lock Output Converter Local Oscillator VCO Schematic Diagram



NOTES :

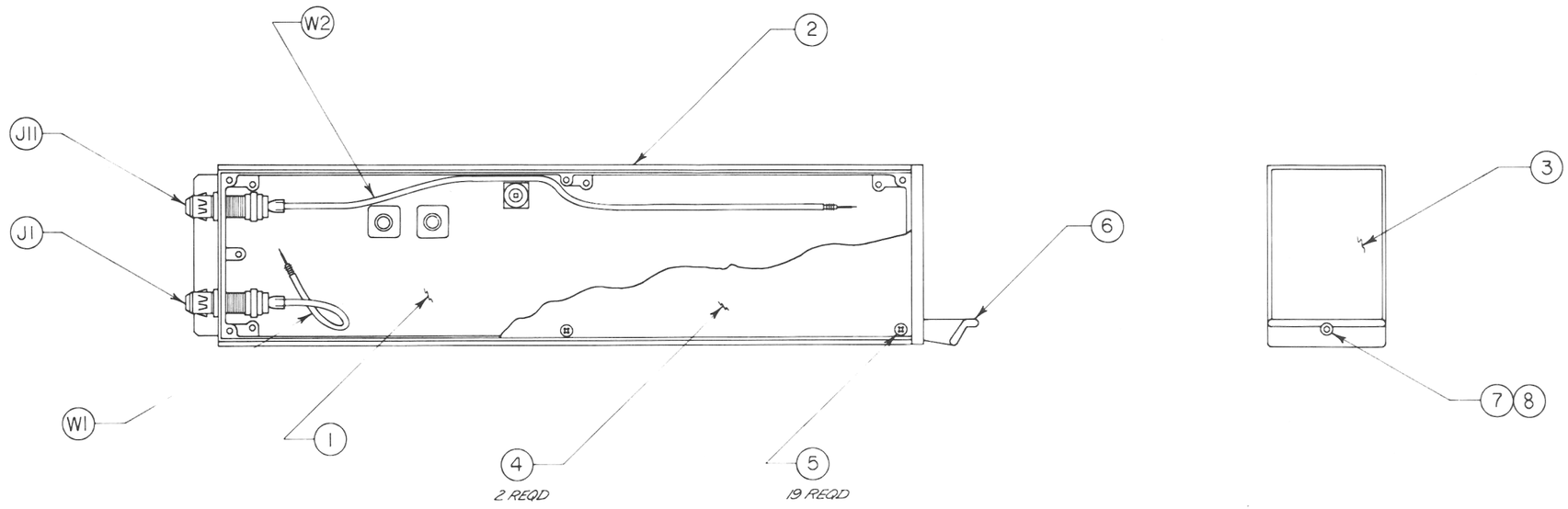
1. C12 NOT ASSIGNED.

2 USE GLASS BEADS UNDER COMPONENT.

SEE SEPARATE PARTS LIST

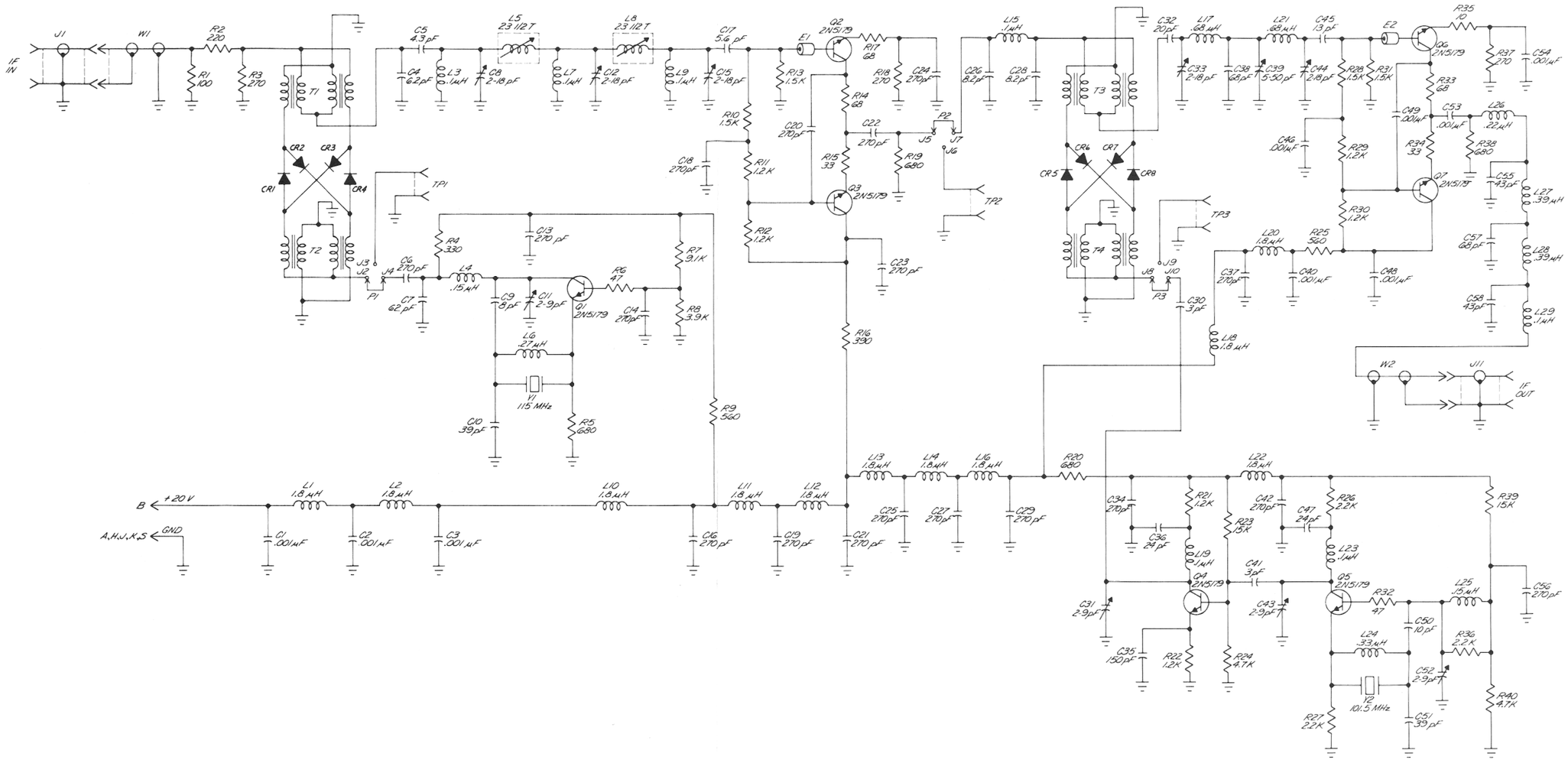
233822-233824C

Figure 8-55. Hyperband Phase Lock Output Converter Local Oscillator VCO PWB Assembly



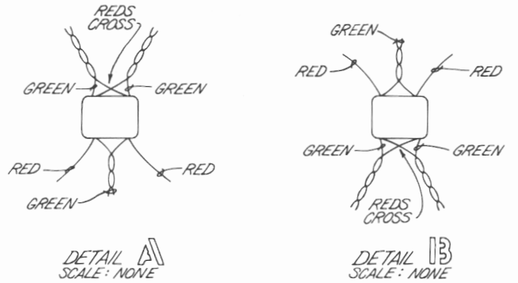
230250

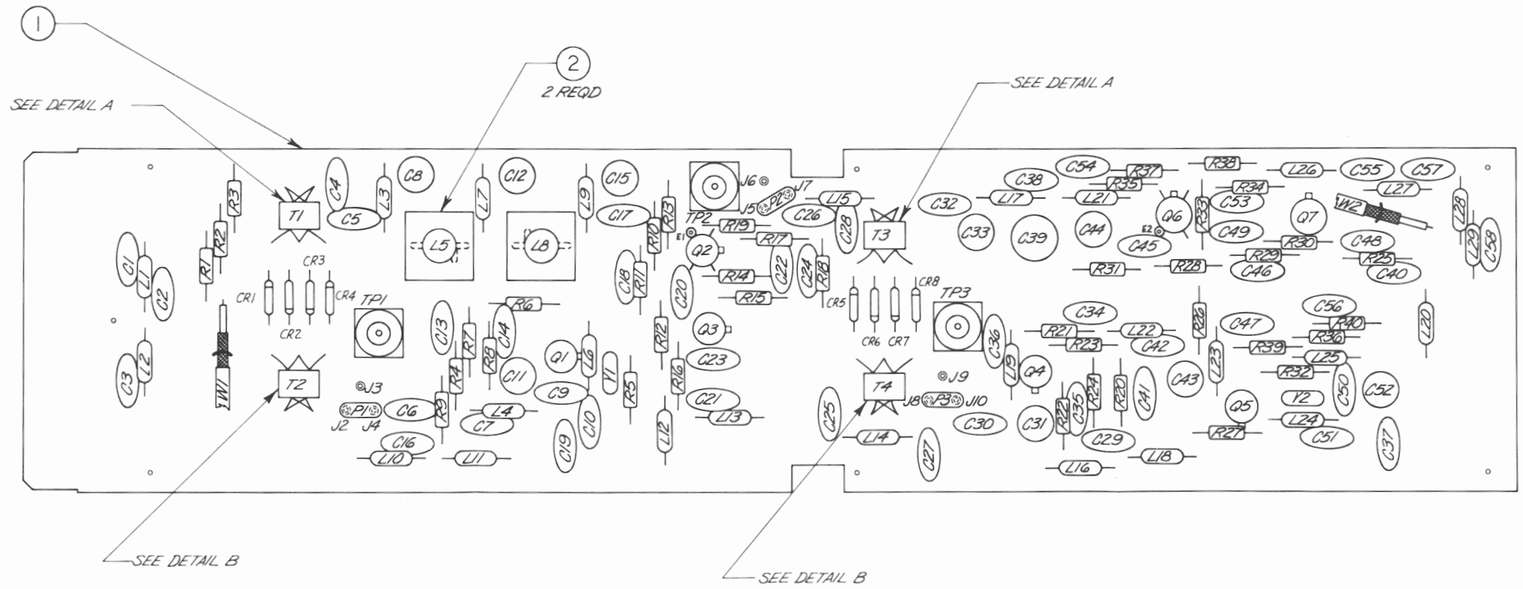
Figure 8-56. Model 6350
Spectrum Inverter Top Assembly



230253A

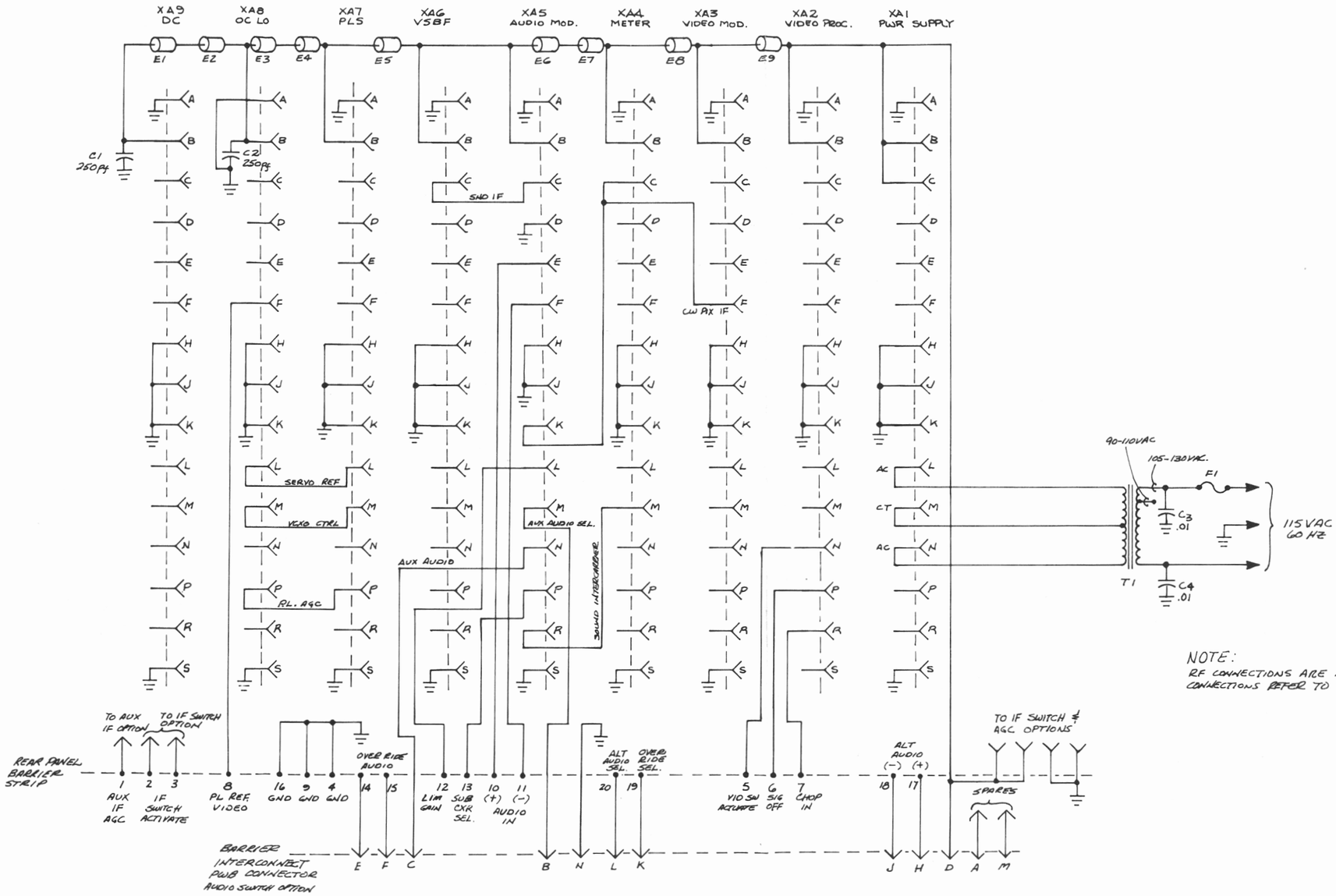
Figure 8-57. Model 6350 Spectrum Inverter Schematic Diagram





230252B

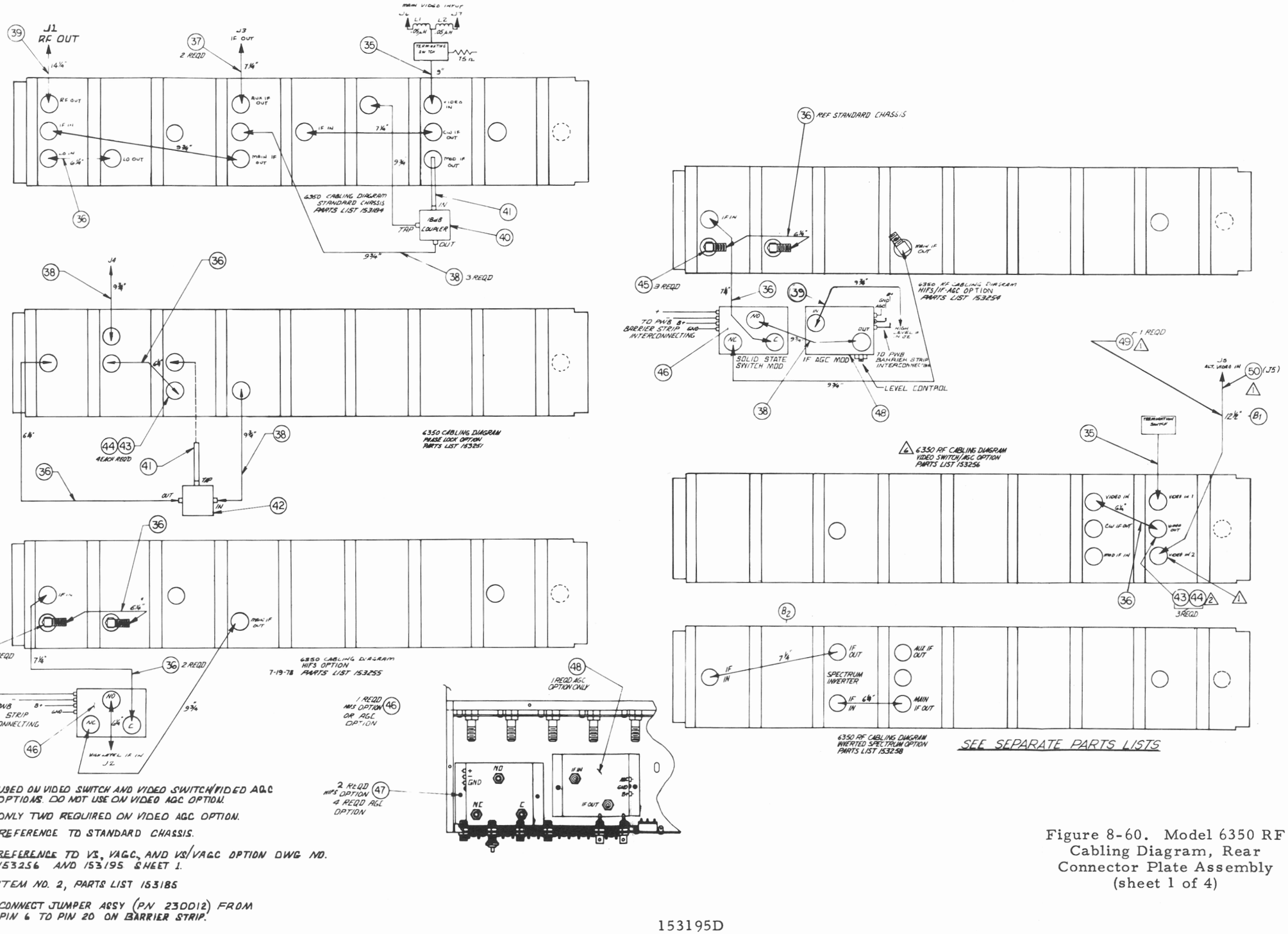
Figure 8-58. Model 6350 Spectrum Inverter Printed-Wiring Board Assembly



NOTE:
RF CONNECTIONS ARE NOT SHOWN ON THIS SCHEMATIC. FOR RF CONNECTIONS REFER TO S-A DRAWING NO. 153195.

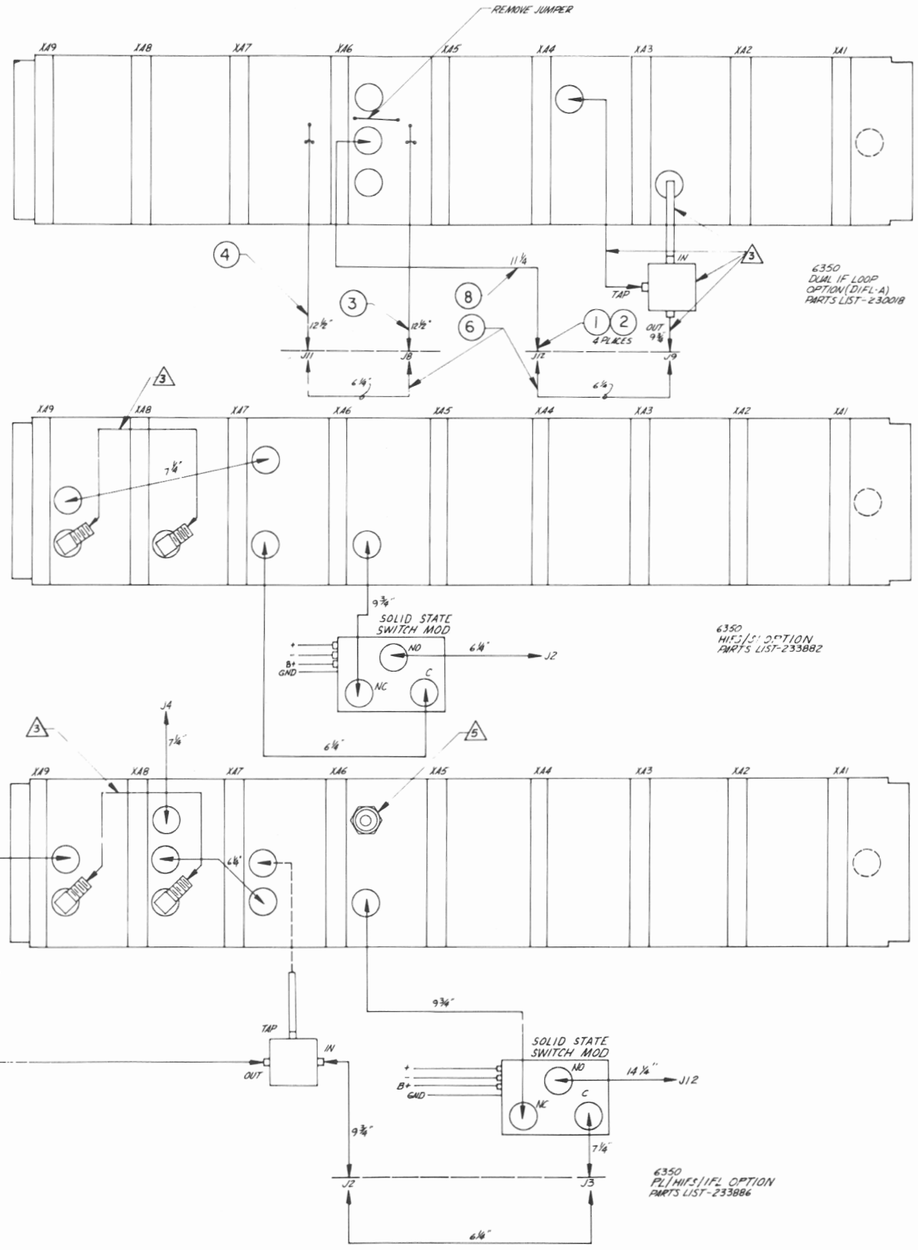
Figure 8-59. Model 6350 Modulator Rear Compartment Schematic Diagram

153182


J1 RF OUT
J3 IF OUT
2 REQD
J4
6350 CABLING DIAGRAM STANDARD CHASSIS PARTS LIST 153184
6350 CABLING DIAGRAM PHASE LOCK OPTION PARTS LIST 153251
6350 CABLING DIAGRAM HIFS OPTION 7-19-78 PARTS LIST 153255
4 EACH REQD
2 REQD
3 REQD
1 REQD AGC OPTION ONLY
1 REQD HIFS OPTION OR AGC OPTION
2 REQD HIFS OPTION 4 REQD AGC OPTION
TO PWB BARRIER STRIP INTERCONNECTING
SOLID STATE SWITCH MOD
IF AGC MOD
LEVEL CONTROL
6350 RF CABLING DIAGRAM HIFS/IF AGC OPTION PARTS LIST 153254
6350 RF CABLING DIAGRAM VIDEO SWITCH/AGC OPTION PARTS LIST 153256
6350 RF CABLING DIAGRAM INVERTED SPECTRUM OPTION PARTS LIST 153258
SEE SEPARATE PARTS LISTS

1. USED ON VIDEO SWITCH AND VIDEO SWITCH/VIDEO AGC OPTIONS. DO NOT USE ON VIDEO AGC OPTION.
2. ONLY TWO REQUIRED ON VIDEO AGC OPTION.
3. REFERENCE TO STANDARD CHASSIS.
4. REFERENCE TO VS, VAGC, AND VS/VAGC OPTION DWG NO. 153256 AND 153195 SHEET 1.
5. ITEM NO. 2, PARTS LIST 153185
6. CONNECT JUMPER ASSY (PN 230012) FROM PIN 6 TO PIN 20 ON BARRIER STRIP.

Figure 8-60. Model 6350 RF Cabling Diagram, Rear Connector Plate Assembly (sheet 1 of 4)



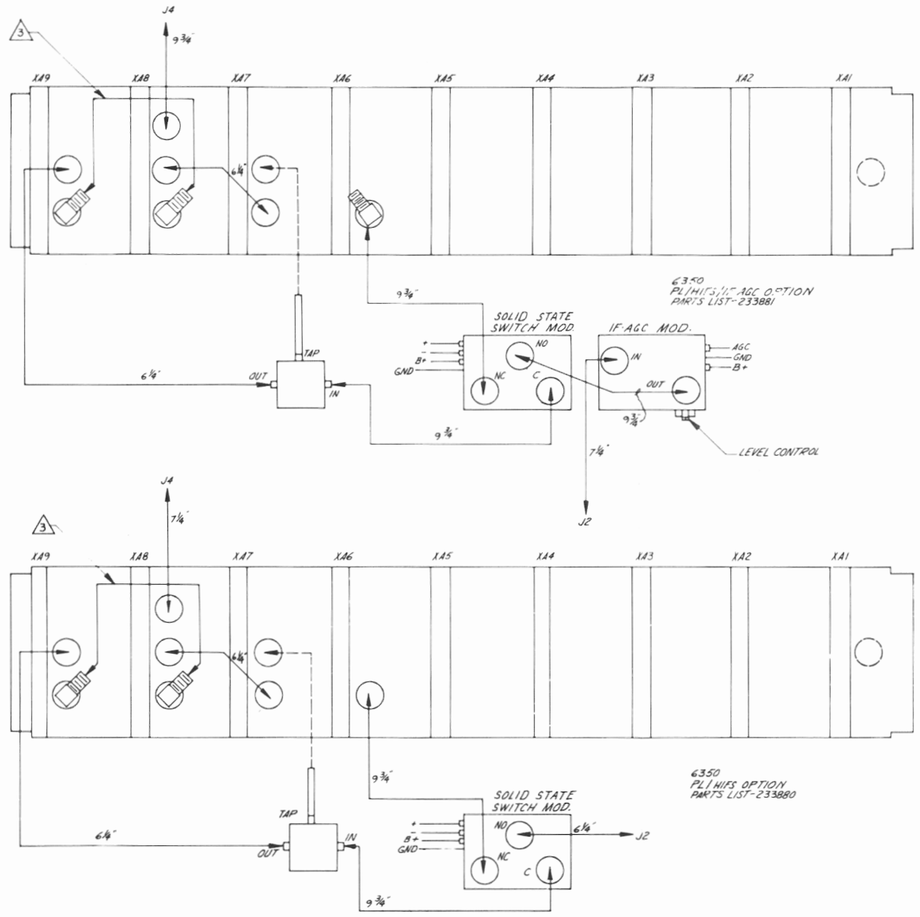
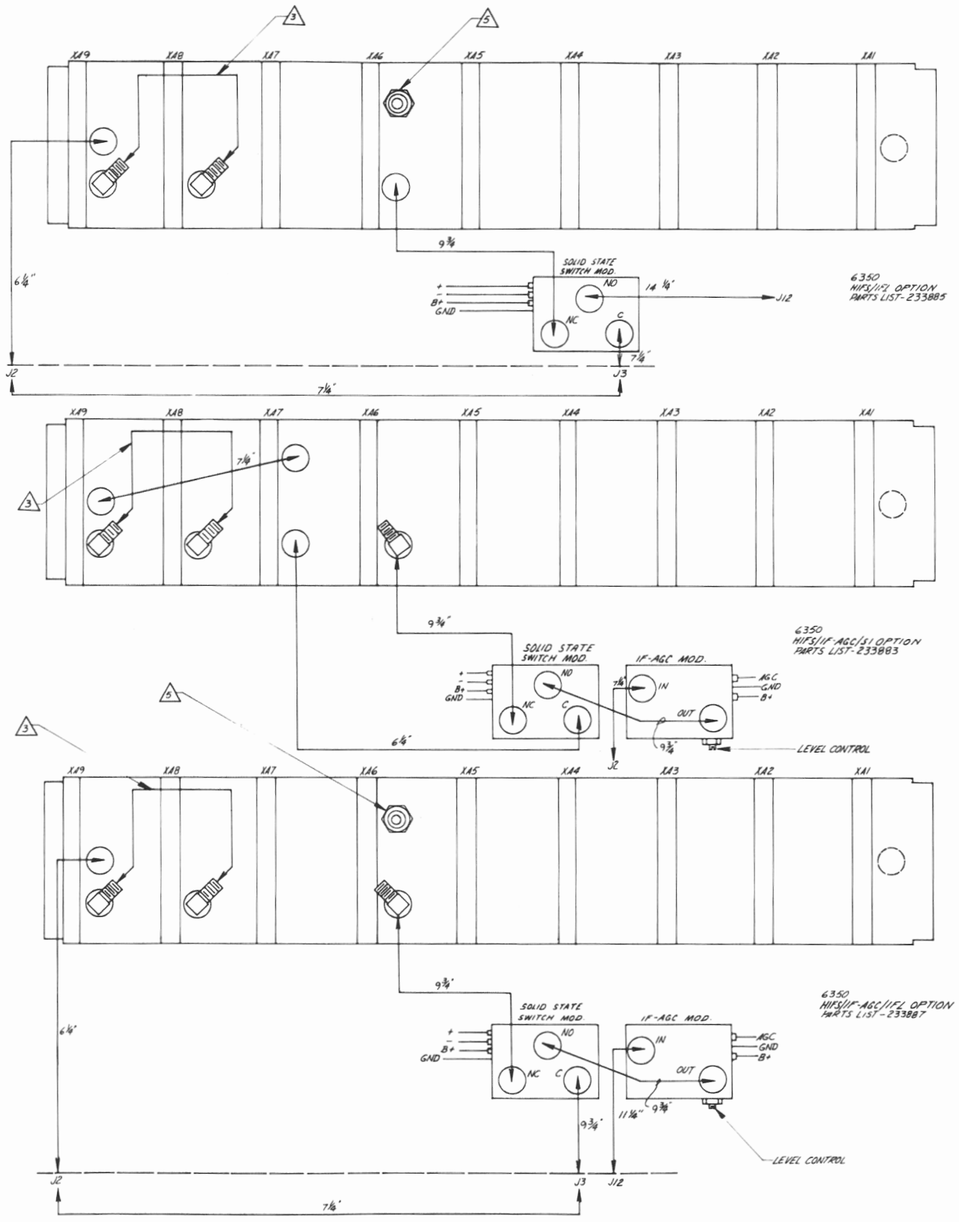


Figure 8-60. Model 6350 RF Cabling Diagram, Rear Connector Plate Assembly (sheet 2 of 4)



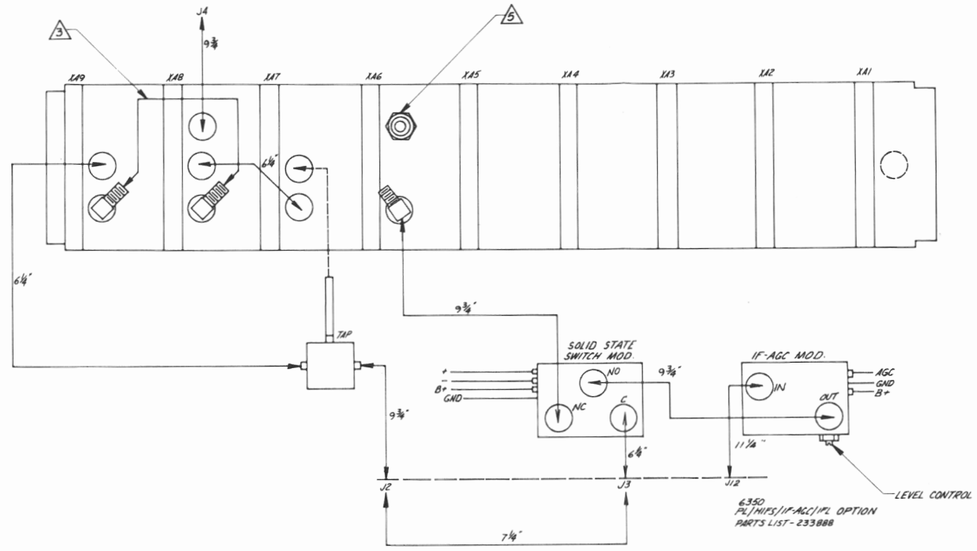
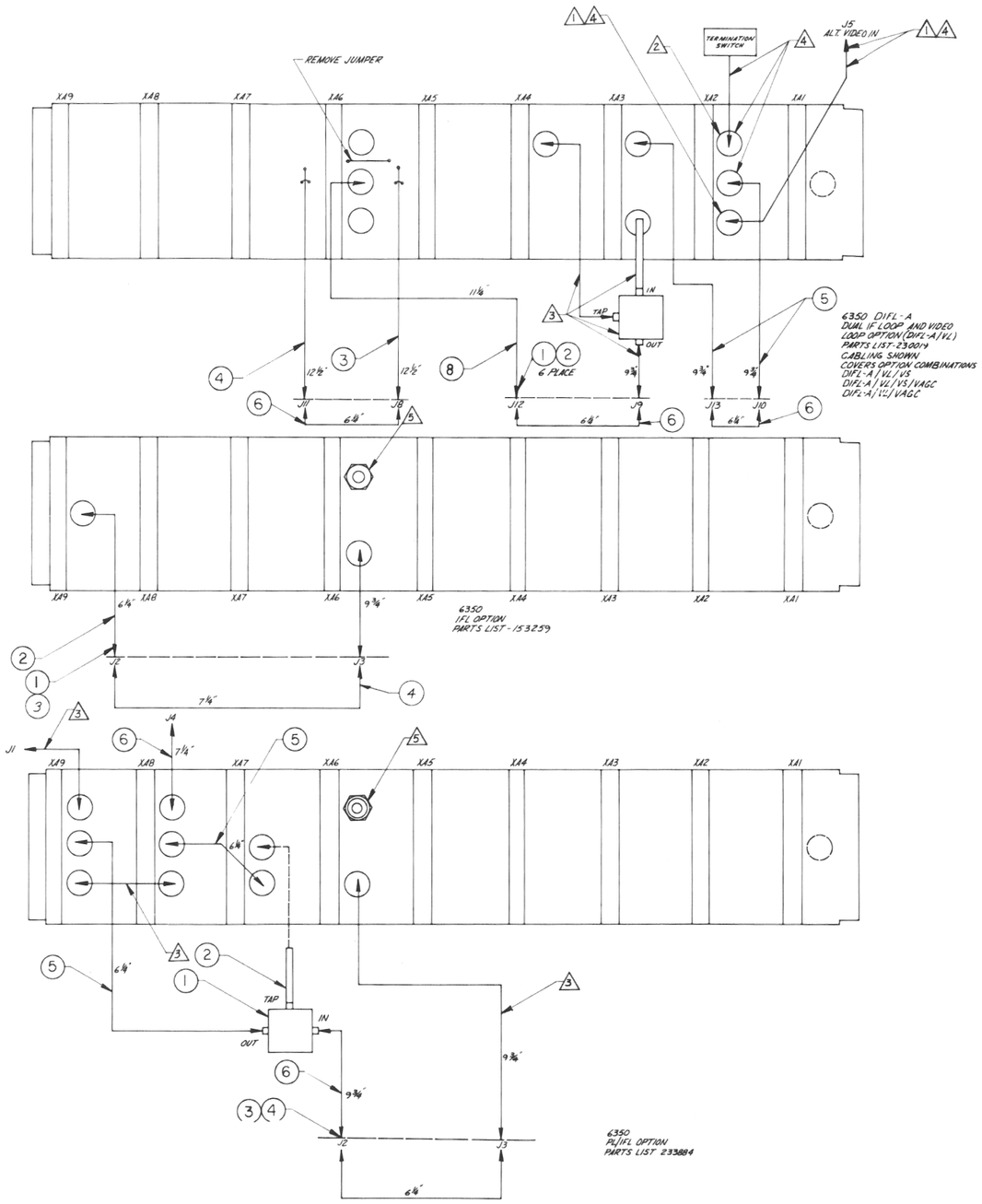
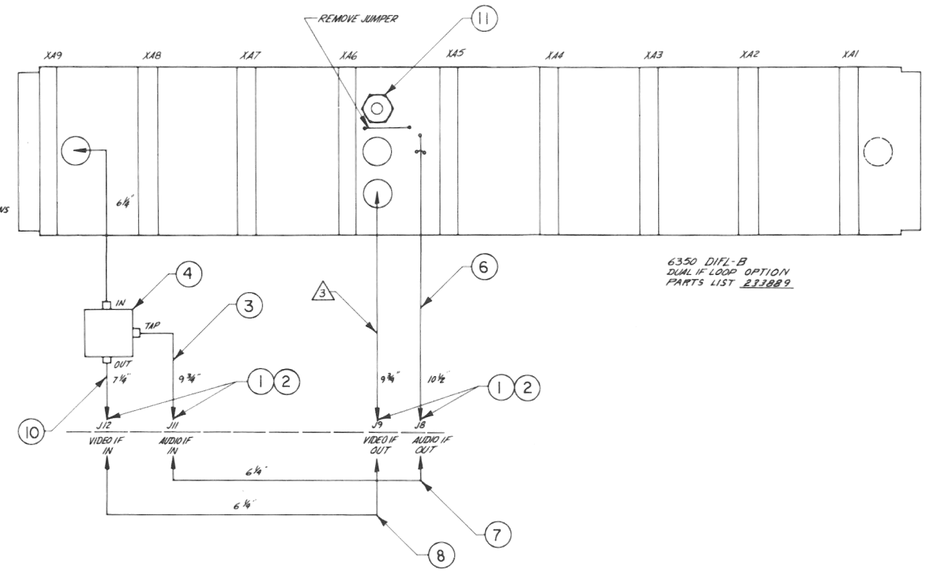


Figure 8-60. Model 6350 RF Cabling Diagram, Rear Connector Plate Assembly (sheet 3 of 4)

153195D





6350 DIFL-B
DUAL IF LOOP OPTION
PARTS LIST 233889

Figure 8-60. Model 6350 RF Cabling Diagram, Rear Connector Plate Assembly (sheet 4 of 4)

153195D

CONVERSION OF VOLTAGE AND POWER RATIOS TO DECIBELS

The basic chart below indicates the number of decibels (dB) corresponding to the listed ratios of voltage or power over the range of −20 to +20 dB. For voltage or power ratios greater than those included in the chart, the ratio can be broken down into a product of two numbers, the value in dB for each found separately, and the two results added. Example: To convert a power ratio of 2,000:1 to dB, express 2,000 as 2×10^3; the number of dB corresponding to a power ratio of 2 is very nearly 3, and the number of dB for a power ratio of 10^3 is 30. Therefore, the power ratio of 2,000:1 is approximately 30 dB + 3 dB = 33 dB. In the lower righthand corner of the chart dB values for voltage and power ratios of integral powers of 10 are given.

Voltage Ratio	*Power Ratio*	*−dB +*	*Voltage Ratio*	*Power Ratio*	*Voltage Ratio*	*Power Ratio*	*−dB +*	*Voltage Ratio*	*Power Ratio*	*Voltage Ratio*	*Power Ratio*	*−dB +*	*Voltage Ratio*	*Power Ratio*
1.000	**1.000**	**0**	**1.000**	**1.000**	**.447**	**.200**	**7.0**	**2.239**	**5.012**	**.200**	**.0398**	**14.0**	**5.012**	**25.12**
.989	.977	.1	1.012	1.023	.442	.195	7.1	2.265	5.129	.197	.0389	14.1	5.070	25.70
.977	.955	.2	1.023	1.047	.437	.191	7.2	2.291	5.248	.195	.0380	14.2	5.129	26.30
.966	.933	.3	1.035	1.072	.432	.186	7.3	2.317	5.370	.193	.0372	14.3	5.188	26.92
.955	.912	.4	1.047	1.096	.427	.182	7.4	2.344	5.495	.191	.0363	14.4	5.248	27.54
.944	.891	.5	1.059	1.122	.422	.178	7.5	2.371	5.623	.188	.0355	14.5	5.309	28.18
.933	.871	.6	1.072	1.148	.417	.174	7.6	2.399	5.754	.186	.0347	14.6	5.370	28.84
.923	.851	.7	1.084	1.175	.412	.170	7.7	2.427	5.888	.184	.0339	14.7	5.433	29.51
.912	.832	.8	1.096	1.202	.407	.166	7.8	2.455	6.026	.182	.0331	14.8	5.495	30.20
.902	.813	.9	1.109	1.230	.403	.162	7.9	2.483	6.166	.180	.0324	14.9	5.559	30.90
.891	**.794**	**1.0**	**1.122**	**1.259**	**.398**	**.159**	**8.0**	**2.512**	**6.310**	**.178**	**.0316**	**15.0**	**5.623**	**31.62**
.881	.776	1.1	1.135	1.288	.394	.155	8.1	2.541	6.457	.176	.0309	15.1	5.689	32.36
.871	.759	1.2	1.148	1.318	.389	.151	8.2	2.570	6.607	.174	.0302	15.2	5.754	33.11
.861	.741	1.3	1.161	1.349	.385	.148	8.3	2.600	6.761	.172	.0295	15.3	5.821	33.88
.851	.724	1.4	1.175	1.380	.380	.145	8.4	2.630	6.918	.170	.0288	15.4	5.888	34.67
.841	.708	1.5	1.189	1.413	.376	.141	8.5	2.661	7.079	.168	.0282	15.5	5.957	35.48
.832	.692	1.6	1.202	1.445	.372	.138	8.6	2.692	7.244	.166	.0275	15.6	6.026	36.31
.822	.676	1.7	1.216	1.479	.367	.135	8.7	2.723	7.413	.164	.0269	15.7	6.095	37.15
.813	.661	1.8	1.230	1.514	.363	.132	8.8	2.754	7.586	.162	.0263	15.8	6.166	38.02
.804	.646	1.9	1.245	1.549	.359	.129	8.9	2.786	7.762	.160	.0257	15.9	6.237	38.90
.794	**.631**	**2.0**	**1.259**	**1.585**	**.355**	**.126**	**9.0**	**2.818**	**7.943**	**.159**	**.0251**	**16.0**	**6.310**	**39.81**
.785	.617	2.1	1.274	1.622	.351	.123	9.1	2.851	8.128	.157	.0246	16.1	6.383	40.74
.776	.603	2.2	1.288	1.660	.347	.120	9.2	2.884	8.318	.155	.0240	16.2	6.457	41.69
.767	.589	2.3	1.303	1.698	.343	.118	9.3	2.917	8.511	.153	.0234	16.3	6.531	42.66
.759	.575	2.4	1.318	1.738	.339	.115	9.4	2.951	8.710	.151	.0229	16.4	6.607	43.65
.750	.562	2.5	1.334	1.778	.335	.112	9.5	2.985	8.913	.150	.0224	16.5	6.683	44.67
.741	.550	2.6	1.349	1.820	.331	.110	9.6	3.020	9.120	.148	.0219	16.6	6.761	45.71
.733	.537	2.7	1.365	1.862	.327	.107	9.7	3.055	9.333	.146	.0214	16.7	6.839	46.77
.724	.525	2.8	1.380	1.905	.324	.105	9.8	3.090	9.550	.145	.0209	16.8	6.918	47.86
.716	.513	2.9	1.396	1.950	.320	.102	9.9	3.126	9.772	.143	.0204	16.9	6.998	48.98
.708	**.501**	**3.0**	**1.413**	**1.995**	**.316**	**.100**	**10.0**	**3.162**	**10.000**	**.141**	**.0200**	**17.0**	**7.079**	**50.12**
.700	.490	3.1	1.429	2.042	.313	.0977	10.1	3.199	10.23	.140	.0195	17.1	7.161	51.29
.692	.479	3.2	1.445	2.089	.309	.0955	10.2	3.236	10.47	.138	.0191	17.2	7.244	52.48
.684	.468	3.3	1.462	2.138	.306	.0933	10.3	3.273	10.72	.137	.0186	17.3	7.328	53.70
.676	.457	3.4	1.479	2.188	.302	.0912	10.4	3.311	10.96	.135	.0182	17.4	7.413	54.95
.668	.447	3.5	1.496	2.239	.299	.0891	10.5	3.350	11.22	.133	.0178	17.5	7.499	56.23
.661	.437	3.6	1.514	2.291	.295	.0871	10.6	3.388	11.48	.132	.0174	17.6	7.586	57.54
.653	.427	3.7	1.531	2.344	.292	.0851	10.7	3.428	11.75	.130	.0170	17.7	7.674	58.88
.646	.417	3.8	1.549	2.399	.288	.0832	10.8	3.467	12.02	.129	.0166	17.8	7.762	60.26
.638	.407	3.9	1.567	2.455	.285	.0813	10.9	3.508	12.30	.127	.0162	17.9	7.852	61.66
.631	**.398**	**4.0**	**1.585**	**2.512**	**.282**	**.0794**	**11.0**	**3.548**	**12.59**	**.126**	**.0159**	**18.0**	**7.943**	**63.10**
.624	.389	4.1	1.603	2.570	.279	.0776	11.1	3.589	12.88	.125	.0155	18.1	8.035	64.57
.617	.380	4.2	1.622	2.630	.275	.0759	11.2	3.631	13.18	.123	.0151	18.2	8.128	66.07
.610	.372	4.3	1.641	2.692	.272	.0741	11.3	3.673	13.49	.122	.0148	18.3	8.222	67.61
.603	.363	4.4	1.660	2.754	.269	.0724	11.4	3.715	13.80	.120	.0145	18.4	8.318	69.18
.596	.355	4.5	1.679	2.818	.266	.0708	11.5	3.758	14.13	.119	.0141	18.5	8.414	70.79
.589	.347	4.6	1.698	2.884	.263	.0692	11.6	3.802	14.45	.118	.0138	18.6	8.511	72.44
.582	.339	4.7	1.718	2.951	.260	.0676	11.7	3.846	14.79	.116	.0135	18.7	8.610	74.13
.575	.331	4.8	1.738	3.020	.257	.0661	11.8	3.890	15.14	.115	.0132	18.8	8.710	75.86
.569	.324	4.9	1.758	3.090	.254	.0646	11.9	3.936	15.49	.114	.0129	18.9	8.811	77.62
.562	**.316**	**5.0**	**1.778**	**3.162**	**.251**	**.0631**	**12.0**	**3.981**	**15.85**	**.112**	**.0126**	**19.0**	**8.913**	**79.43**
.556	.309	5.1	1.799	3.236	.248	.0617	12.1	4.027	16.22	.111	.0123	19.1	9.016	81.28
.550	.302	5.2	1.820	3.311	.246	.0603	12.2	4.074	16.60	.110	.0120	19.2	9.120	83.18
.543	.295	5.3	1.841	3.388	.243	.0589	12.3	4.121	16.98	.108	.0118	19.3	9.226	85.11
.537	.288	5.4	1.862	3.467	.240	.0575	12.4	4.169	17.38	.107	.0115	19.4	9.333	87.10
.531	.282	5.5	1.884	3.548	.237	.0562	12.5	4.217	17.78	.106	.0112	19.5	9.441	89.13
.525	.275	5.6	1.905	3.631	.234	.0550	12.6	4.266	18.20	.105	.0110	19.6	9.550	91.20
.519	.269	5.7	1.928	3.715	.232	.0537	12.7	4.315	18.62	.104	.0107	19.7	9.661	93.33
.513	.263	5.8	1.950	3.802	.229	.0525	12.8	4.365	19.05	.102	.0105	19.8	9.772	95.50
.507	.257	5.9	1.972	3.890	.227	.0513	12.9	4.416	19.50	.101	.0102	19.9	9.886	97.72
.501	**.251**	**6.0**	**1.995**	**3.981**	**.224**	**.0501**	**13.0**	**4.467**	**19.95**	**.100**	**.0100**	**20.0**	**10.000**	**100.00**
.496	.246	6.1	2.018	4.074	.221	.0490	13.1	4.519	20.42		10^{-3}	30		10^3
.490	.240	6.2	2.042	4.169	.219	.0479	13.2	4.571	20.89	10^{-2}	10^{-4}	40	10^2	10^4
.484	.234	6.3	2.065	4.266	.216	.0468	13.3	4.624	21.38		10^{-5}	50		10^5
.479	.229	6.4	2.089	4.365	.214	.0457	13.4	4.677	21.88	10^{-3}	10^{-6}	60	10^3	10^6
.473	.224	6.5	2.113	4.467	.211	.0447	13.5	4.732	22.39		10^{-7}	70		10^7
.468	.219	6.6	2.138	4.571	.209	.0437	13.6	4.786	22.91	10^{-4}	10^{-8}	80	10^4	10^8
.462	.214	6.7	2.163	4.677	.207	.0427	13.7	4.842	23.44		10^{-9}	90		10^9
.457	.209	6.8	2.188	4.786	.204	.0417	13.8	4.898	23.99	10^{-5}	10^{-10}	100	10^5	10^{10}
.452	.204	6.9	2.213	4.898	.202	.0407	13.9	4.955	24.55		10^{-11}	110		10^{11}
										10^{-6}	10^{-12}	120	10^6	10^{12}

Scientific-Atlanta, Inc.

United States: Box 105027, Atlanta, Georgia 30348; Telephone 404-925-5000; TWX 810-766-4912; Telex 0542898
Canada: 1640 Bonhill Road, Unit 6, Mississauga, Ontario L5T 1C8, Canada; Telephone 416-677-6555; Telex 06983600
Europe: Horton Manor, Stanwell Road, Horton, Slough SL3 9PA, England; Telephone Colnbrook (02812) 3211; Telex 849406